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Cellulose Acetate as a Cigarette-Burn-Proof Finish for Furniture Tops

by Greggs Phillips
Finish Materials Technician
with Nationally-Known Firm

THE FIRST demand for a cigaret-burn-proof finish was created by manufacturers of small metal articles such as brass ash trays, and has existed since this group of finish consumers has been aware of the non-inflammable properties of cellulose acetate. Dissolved in suitable solvents, cellulose acetate flake will film out to give a fairly satisfactory protective coating on bright polished metal, if properly combined with resins and plasticizers both of which are combustible. The service results of such a product have been more acceptable than those of an orthodox pyroxylin metal lacquer, but because of the much greater cost, acetate lacquer has not met with consumer acceptance, and the burning resistance, because of the inflammable plasticizers required with cellulose acetate, has been limited in its superiority over pyroxylin in this respect.

With the advent of "Repeal," preceded by a nation-wide demand for bridge tables the tops of which would not be marred by a lighted cigarette, a number of stylists have insisted upon a finish that would be proof not only against marring by a glowing cigarette, but also against accidental spillage of alcoholic beverages. Such an ideal finish has also been asked for on new equipment purchased by hotels and taverns. In order to meet these requirements the finisher has turned to any number of nationally known lacquer suppliers for recommendation. If he obtained one it had reservations attached.

Editor's Note: After reading an editorial about "Cigarette-Burn-Proof Wood Finish" in February Industrial Finishing, the author wrote an interesting and informative letter which was published along with three others in April issue, pages 37 to 39. At our request he has written this article which further amplifies what he stated in his former letter.

The reason for the lacquer manufacturers' conservatism in recommending a finish to meet these severe conditions is not founded upon their disinterest in formulating a suitable finish, but upon the physical and chemical limitations of ingredients which could be used. The first point to be considered is the inflammability characteristic of the film-forming ingredients and, if some are more combustible than others, just how the various possible ingredients could be proportioned to fulfill the requirement of 100% char resistance. Alcohol-resistant pyroxylin lacquers, when applied to wood, show slightly greater fire resistance than do regular wood lacquers, but notwithstanding this they fail to meet with approval. In view of this the alcohol-resistant lacquer will not be given further consideration in this discussion.

Cellulose Acetate High Priced

Recognizing that pyroxylin lacquer and orthodox or synthetic resin varnishes have a definite charring point far below the ignition temperature of a cigar or cigarette, the only ingredient which can be called upon for this service is cellulose acetate. This cellulose ester has not been formulated for more extensive use on wood because:

1) Cellulose acetate and its solvents are very expensive.

2) The resins compatible with cellulose acetate are limited in availability and their cost is high.

3) The build obtainable with cellulose acetate as a base is extremely low.

On a cost basis a finisher using a suitable cellulose acetate lacquer, if obtainable, would have to pay approximately twice as much as for a patent-type wood lacquer. Non-patent lacquers could not be used for price comparison because resins incorporated with the high-viscosity pyroxylin would probably exhibit no better fire resistance than orthodox varnish. Adding this initial disadvantage to the low build characteristics of cellulose acetate on wood, which could be overcome only by expensive multiple coating, the finished article would not return a high enough price in the market to warrant the use of this ideal fire-resisting ingredient.

Cellulose Acetate in Sheet Form

Cellulose acetate is available in sheet form under a number of different trade names, and in this form could be adapted to certain requirements for a cigarette-burn-proof finish and simultaneous guaranteed alcohol resistance. In this form the cost of multiple coating to obtain satisfactory build lacking in the acetate lacquer would be represented in part by the cost of the sheeting, and therefore would not be eliminated to the extent of selling the finished article at less than a premium price. The acetate sheeting could be applied by swelling it in a mixture of acetone and water, stretching the softened sheet over the table top, trimming the edges, and securing the sheet on the table edges by means of a cellulose acetate cement, employing in principle the method used in applying pyroxylin sheeting to toilet seats. The cellulose acetate cement could be made by the finisher by dissolving his acetate scraps in acetone.

Lacquer chemists have not devoted extensive research effort in

formulating cellulose acetate for use on wood because of its prohibitive cost as a basic lacquer ingredient. In spite of the demand for cellulose acetate lacquer as a wood finish, until suitable formulas are developed, the fastidious finisher will either have to adopt the acetate in its sheet form or sell his trade to the idea that there is no burn-proof finish.

Editor's Note: Inasmuch as the subject discussed in this article is of considerable interest and importance to many readers, we have taken the liberty of inviting additional comments from others who are familiar with the technique of lacquer formulation and the performance of lacquer coatings. In this connection, Mr. Harry Eastwood, Technical Director of The A. Wilhelm Co. (division of The Glidden Co.), Reading, Pa., says:

"I have read the article on 'Cellulose Acetate as a Cigarette-Burn-Proof Finish,' and have also submitted it to our lacquer man, Mr. S. C. Uhler. Neither of us can find anything to criticize in the technical points discussed and we are of the opinion that this article is a reasonably accurate statement of facts."

Mr. Albert J. Crichton, Lacquer Chemist and Formulator with R. N. Nason & Co., San Francisco, Calif., says:

"Regarding this article, I might say that it is all right. We formulators have tried out and played with cellulose acetate but it is, as stated by Mr. Phillips, still too high in price and too low in solids, or build. The adhesion is also very poor. However, it does give a nice clear flexible film and might be used as stated, namely by softening it and stretching it over the surface to be covered. This was quite common with celluloid a few years back and some of it is still worked that way, especially on toilet seats and on heels for ladies' shoes. The article may arouse some interest and I believe it worth publishing."

Some interesting comments offered by our good friend, Mr. K. N. Kathju, Consulting Chemist in the Automotive Division of the Arco Co., Cleveland, Ohio, and Detroit, Mich., are as follows:

"I have carefully read the article and I believe the statements are very truthful, in that the cost of cellulose acetate finishes is well nigh prohibitive.

"From a purely technical standpoint, I can not agree with statements made occasionally in the article, that the resins and plasticizers to be used with a cellulose acetate type material are combustible. You can purchase plasticizers that will not only be non-combustible, but will retard the burning of nitrocellulose type lacquers.

"As far as charring is concerned, the finish will char, whether it is cellulose type or not, because after all, whether made out of nitrocellulose, cellulose acetate or wood, the finish will be organic in nature which implies that it has a carbon molecule somewhere in the finish, and carbon will char.

"The suggested use of cellulose acetate sheet is probably useful, but then you would not call it a finish, and such a recommendation should find no place in your magazine. That will be getting away from finishing.

"I have a container containing some cellulose acetate flakes, and I find it chars just as badly when a match is brought in contact with it as any finish, whether it is varnish type or lacquer type.

"Under the circumstances, I don't know exactly how to comment on this article. There is nothing objectionable in it, in view of the fact that it is taken for granted that cellulose acetate type material does not burn. That is why in Germany, by law ever since the beginning of the World War, no airplane wings or fuselages have been finished with ordinary nitrocellulose type dope. When a 'plane catches on fire the nitrocellulose type dope will burn furiously, whereas the cellulose acetate type dope, which they use in Germany, does not burn; it merely chars.

"Personally, I think no one would like to have cellulose acetate type finish on a table, because it will char just the same. As far as the burning is concerned, I have never seen a small table, which was finished in lacquer for instance, catch fire even when the people were drunk. It will get charred, no question about it, so will a cellulose acetate type of coating, but not as badly as the former."

Finishing Pressed Metal

by J. B. Nealey
American Gas Association

★ ★ ★

WHEN ENGINEERS with a technical background in one industry bring this experience into an entirely new field, something always happens. In the most recent application of this mental transfer, automotive brains to bathroom and kitchenware manufacture, the result was as happy as it was startling. Legendary ideas in this field were upset and new practices were established.

To come to the point, the heavy cast-iron, vitreous-enameled bath tub and kitchen sink have been supplanted with similar items of sheet steel, enameled in automatic temperature-controlled gas-fired furnaces. In this case the foundry has been discarded for the press, and an improvement in product has been obtained. A large part of this betterment is through the remarkable lightness achieved.

The heavy cast-iron bath tub of today weighs anywhere from 375 to 425-lbs., while the light sheet-steel tub weighs only 98 to 125-lbs. A 50 to 75-lb. sink will supplant those of 225 to 250-lbs. The saving in weight in bathrooms on our most modern ocean liners would amount to 1,300,000-lbs. This development has been brought about by the Briggs Mfg. Co., Detroit, Mich., and includes the complete bathroom and kitchen sets of a strictly modern design.

Bath Tubs and Sinks

Metal Cleaning
Conveyor Systems
Spray Finishing
Vitreous Enameling
Baking Ovens
Gas-Fired Furnaces

This concern has eight factories in Detroit and has converted one to the manufacture of the items mentioned. A special sheet of 99% pure iron, that has been carefully normalized, is cut to length and width on shears. In the press room are some of the world's largest presses, specially built to form bath tubs. This is a most difficult draw and the necessity for the radius on the front, back, and bottom, required when pouring iron, is eliminated so that a flat bottom is obtained. A bath tub is also available with a ribbed bottom which tends to lessen slipping—a new safety feature.

This 4-story plant is completely equipped with conveyors, starting with one of the slat type on the upper floor. Stamped articles from the press room are carried along while various operations are performed such as assembling parts, grinding off rough spots, welding on brackets, etc. The welders are of Briggs design and are swung from the ceiling. Transferred to an overhead chain conveyor, the stampings pass through booths where they are blast-cleaned to roughen the surface in preparation for the porcelain application. This conveyor passes through the floor and on

to a completely enclosed pickle room on the ground floor.

Metal Cleaning; Conveyors

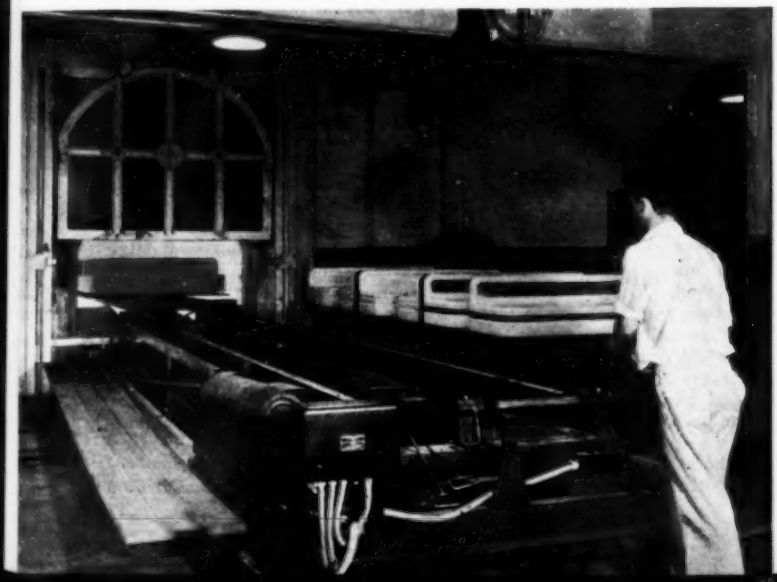
The pickle room contains seven large steel tanks with an overhead monorail and hoist system. The work is handled in big steel baskets. The tanks are heated with steam pipes and hooded for fume removal. Preparation here includes an alkaline cleaning solution, a water rinse, acid dip, water rinse and a second alkaline dip to neutralize the acid. Returned to the chain conveyor, the pickled and washed items pass through an oven where they are dried. The parts are now sprayed with vitreous enamel. Each part is given two coats besides the ground coat, all coats being sprayed on, dried, and then burned on in gas-fired furnaces.

Spray Equipment

There are three ultra-modern spray units, each consisting of a spray booth, an oven and an overhead chain conveyor. Each spray booth is 15x30-ft., and is equipped with a row of floodlights along one side and an enamel reclamator on the other. The latter consists of a 4-ft. partition along the wall of the booth, with water sprays behind and above it and a trough at the bottom. Enamel-laden air is sucked in over the top of this partition by an induced draft, and the enamel is washed out by the water which is caught in the trough. From this the enamel is reclaimed for re-use. The ovens are constructed of insulated sheet steel and are 50-ft. long. Here the parts are dried as they pass through on their way to the furnaces.

Enamel furnaces are gas fired, and equipped with two motor-operated speed forks each. This is

The illustration below shows one of the gas-fired furnaces in which the vitreous enameled products are "fired" or vitrified.



to speed up production, as one speed fork can be loaded or unloaded while the other is in operation. These furnaces are of the full muffle type, 8-ft. wide, 10-ft. high and 15-ft. long inside. There are three alloy rails on three rows of refractory piers for the work to rest on. The muffle walls are corbeled. Set in front and underfiring the muffle are three gas burners from which the hot products of combustion rise up all around the muffle. Doors are opened and closed by remote control. Temperatures are maintained with automatic temperature controls of the potentiometer type actuating on-and-off valves in the gas supply lines to the burners. Recording pyrometers are also a part of this equipment.

As in most sheet metal enamel practice, the ground coat is burned on at more than 1,500°F. for several minutes. . . . The two successive white coats are burned on at about 1,500°F. each. If color is desired, it is incorporated in the enamel. Decorative effects in black or various color combinations are applied with a soft composition roll and burned separately. Great care must be taken in the manufacture of the enamel to obtain a co-efficient of expansion which matches that of the steel base to which it is applied. As an average, the weight of bathroom and kitchen items formed of sheet metal is only about 1/3 of that of cast-iron ware. Savings in shipping and installation costs are considerable.

Testing the Finish

Research workers of this concern devised an ingenious test which proves that the porcelain enamel, burned onto the formed metal ware in gas-fired furnaces, will last a family of four, bathing daily, for more than a century. This test consisted of dropping a 480-lb. weight into a tub, by a special machine, at the rate of 23 times a minute. With each "drop," the tub was "flexed" to a greater degree than by an average person stepping into the tub. Actually, the weight represented an overload of 280-lbs. so as to provide an excessive factor of safety. In this manner, the tub was flexed 139,000 times without any defects of enamel or metal showing. This number of flextures was equal to four baths daily for 102 years.

To summarize the advantages, we have improved appearance, weight reductions, and lower cost of manufacture, shipping, handling, and installation. The total aggregate of these "cuts" is considerable and broadens the market for this type of merchandise.

Using the blast-cleaning equipment.

HOW TO MAKE AND USE

Silk Screen Stencils

by Harry L. Hill
An Experienced, Skillful Operator

WITH YOUR silk screen stencil equipment all prepared and in readiness for work, the next and most important item is the paint. There is no all-purpose paint that will screen or print equally well on all surfaces. It is necessary to use different paints for different surfaces. The liquids or grinding vehicles used in paints for stenciling cardboard, wood, glass, and other absorbent and non-absorbent surfaces differ considerably in both mechanical and chemical properties. Without the right kind of paint mixed to the proper consistency, one can not get sharpness of detail when printing—nor good coverage, adhesion or durability of color.

Buy paint from a reputable manufacturer. Several concerns can furnish satisfactory screen process paints, but their products are not what might be termed "low-priced." Cheap paints are of very little value and often cause the silk screen processor no end of trouble and loss of time, wasted material and fading of colors. These difficulties make cheap paint a rather expensive article in the long run. Remember the slogan: "Good paint need not be expensive, but poor paints always are."

Any manufacturer of quality process colors can also supply information regarding the paints needed for different surfaces, as well as suitable thickening or reducing mediums necessary to make the paint screen perfectly. The paint manufacturer knows just what his material contains and naturally he can tell you what to do in case you have difficulty with it.

Do not always blame the paint if your prints are not what they should be. Extreme differences in temperature of the shop may cause trouble. For example, the shop may be oven warm during

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Editor's Note — In Part I of this article, which appeared last month, the author described and illustrated with line drawings exactly how to: 1) design and make the silk screen frames; 2) select, stretch and fasten the silk; 3) layout, cut and attach stencils; 4) hinge stencil frame to work table; 5) prepare and place guides; 6) design and make the squeegee tool.

In this final article (Part II) he discloses important information about the selection and use of process paints, tells how to use the equipment and materials to produce satisfactory stencil work, and explains how to clean and change used screen stencils.

the day, but down almost to zero temperature at night. Big variations in temperature affect the oil, varnishes and other vehicles in paint and, as a result, the paint may not screen well or give satisfactory results.

To get the best results from process paints, the room in which they are used should be kept at a fairly uniform temperature of not less than 70°F. I have seen the best grade of paint lose its adhesion to glass on account of a big drop in temperature during the night following, while the freshly applied paint was in process of drying. No one can become thoroughly familiar with paints in a short time.

Proper Paint Consistency

The proper consistency of paint for process work will depend upon the nature of the surfaces on which it is to be used. For stencil painting on ordinary paper or cardboard, or any other absorbent surface, the paint should be mixed to the consistency of molasses . . . and quite short or buttery. For use on glass, metal or any hard non-absorbent surface, it is necessary for the paint to be of an elastic texture, containing the necessary varnishes and other vehicles required to produce sharpness in printing as well as to insure proper adhesion.

Aligning the Work; Using the Squeegee

To print with the squeegee, place the card or panel to be printed on the work table, with two of its edges in perfect contact with the guides or stops. Lower the hinged screen and pour in enough paint so that when drawing the squeegee across the screen there will be sufficient paint ahead of it to completely cover the stencil. Hold the squeegee at an angle of not more than 50°. Don't pour too much paint onto the screen; enough to run 20 minutes at a time is plenty. Keep adding fresh material as it's being used. Having too much paint on the screen causes it to emulsify or oxidize on account of being exposed to the air too long. An overload of paint causes clogging of the silk screen and necessitates extra clean-ups.

The squeegee blade should have a flat sharp edge. When necessary, sharpen the squeegee blade by drawing it back and forth lengthwise over a piece of course granite cloth glued to a perfectly flat level surface. Hold the handle upright when sharpening the squeegee blade.

Cleaning the Stencil Screen After it Has Been Used

When a stenciling job has been completed, clean the silk screen thoroughly. First, scrape all paint out of screen with a square piece of cardboard. Save the paint and replace it in its original container. Don't use a putty knife or any hard instrument when scraping off the excess paint, as this will eventually tear the screen, and it cannot be repaired.

After removing all the paint that can be taken off with a scraper, follow up with a cleaning fluid. For shellacked paper stencils, kerosene is the best cleaning fluid. Saturate a ball of cotton waste or a clean rag with kerosene and wash out the heavy paint left in the screen. Throw away the paint stained rags. The first washing with kerosene does little more than remove the heavy material and soften any semi-dried paint that may be in the

mesh of the silk. Take some more kerosene rags or waste and wash the screen again, on the inside only. Then partially dry the inside of the screen with a clean dry rag or waste.

Now take two rags or pieces of waste, one well saturated with kerosene and the other slightly dampened with kerosene. Hold the dampened rag or waste firmly against the bottom side of the screen and scrub against it from the other side with the saturated rag. Be careful in doing this to avoid loosening the edges of the stencil. Now dry the inside of the screen thoroughly; then take a rag well wet with naphtha or gasoline and scrub the inside of the screen; and finally dry it thoroughly with a dry rag or waste.

I have always made it a point to continue cleaning with kerosene until practically no color shows on the cleaning rag. To start cleaning a screen with gasoline or naphtha is likely to cause the paint to dry in the screen, especially along the edges where the stencil is attached to the screen. Rapid-drying cleaning fluids are expensive, as it is necessary to keep the screen and rags completely saturated during the cleaning process. This causes the operator to use three or four times as much cleaning fluid, as well as more rags or waste. I use naphtha merely to dry up the kerosene and prevent lint or dust from becoming imbedded in the stencil.

Removing Stencil from Screen

To remove a stencil from the screen, first remove the frame from the work table by pulling pins from the hinges. Take a piece of glass larger than the stencil and cover it with a piece of muslin or heavy paper so the glass will not cut the silk. Lay the screen bottom side or silk side down upon the covered piece of glass. Next, spread a piece of heavy muslin well saturated with alcohol over the stencil. Lay a piece of glass that will completely cover the stencil on top of the alcohol-saturated cloth, and place some light weights on same. The glass on top of the alcohol-saturated cloth prevents rapid evaporation and gives the alcohol a chance to saturate the silk screen and soften the shellaced stencil, thereby causing the stencil to become loosened. When the stencil has become thoroughly saturated, remove glass and rag, and gently peel the paper stencil from the silk screen.

After the stencil is removed, take some alcohol-saturated rags or waste and remove all traces of shellac from the screen. Then use some fast-cutting lacquer thinner to remove all lacquer up to the muslin sealed edge. Don't saturate the muslin with lacquer thinner, as this will cut the shellac and start loosening it along the edges. A good plan, after placing the muslin sealing edge in position (as described in Part I of this article) is to give it a coat of glue; then only water-soluble cleaner will affect it.

Silk screen stencils described in this article are not suitable for screening lacquer materials. When preparing a screen to be used with lacquer, use water-soluble adhesive for stencils and sealers. Glued paper stencils are all right for lacquer. Water-soluble photographic solutions or sensitizers are equally good for screening lacquer or oil colors.

KITCHEN MAID *Cabinets*

. . . and SHERWIN-WILLIAMS FINISHES

Kitchen Maid Corporation, Andrews, Indiana, uses Sherwin-Williams finishes on its cabinets because everyday tests by thousands of housewives have demonstrated their fitness and superiority for the task.

In its research laboratories Sherwin-Williams puts its kitchen cabinet finishes to very practical tests such as the application of steam and hot water, soap powder, hot lard, boiling coffee, lemon juice, vinegar, and the like. Finishes that can stand up under such tests and still look well have to be more than good.

The Sherwin-Williams Co. offers a complete and colorful line of quick drying finishes for metalware and woodenware which can be sprayed, dipped, brushed or baked. Our paint engineers will gladly give you the facts regarding application to your products. The Sherwin-Williams Co., Cleveland, Ohio, and all principal cities.

SHERWIN-WILLIAMS
INDUSTRIAL FINISHES

Metallic-Type Automobile Finishes and Color Stripes

by Duco Color Advisory Service

THE OUTSTANDING advance of metallic-type finishes to the foreground in the automotive field has brought up the question of which metallic colors are most suitable for automobile use and how they should be striped. The vogue for metallic finishes is stronger than ever. Throughout the industry schedules have been changed to accommodate the tremendous demand for this new type of finish, and in many cases where only one metallic was offered at the beginning of production, two or three are now available. Many large manufacturers are planning to widen the range of their offerings in metallic finishes in 1937, and, since many of them do not seem to understand the limitations of such a finish, a study made of the subject should prove of interest.

Which metallic type colors show up most attractively and what accent striping colors can be used over them for maximum effectiveness on automobiles.

Metallic Grey and Chromium

Metallic lacquers in themselves are so iridescent and so brilliant that they need little to augment their beauty. While grey shades are livelier if striped in a bright color, striping often detracts from the attractiveness of other metallic colors. If a car finished in a metallic color has a chrome moulding and wide chrome discs on the wheels, it will usually be more attractive if no other accent is used.

Greys and Accent Stripe Colors

Undoubtedly, grey is and probably will continue to be the most successful metallic color. Being the most metal-like, it is the metallic least affected by varied lighting. While other colors tend to lose their attractiveness under lighting unfavorable to their pigmentation, metallic grey will bask in any light. Grey shades run the gamut from pale beige grey through green and blue-green to blue. If their best qualities are to be brought out, these variations should be striped as follows:

Neutral grey—stripe with scarlet, vermilion, orange, yellow, emerald, or blue; beige grey—gold bronze, yellow, orange, turquoise, or sea green; green grey

ADVERTISING PAGE REMOVED

—gold bronze, orange, or emerald green; blue-green grey—gold, orange, yellow, bright blue-green; blue-grey—yellow, orange, scarlet, vermilion, or bright pure blue.

Brown, Blue and Green Variations—and Color Stripes

There are many handsome metallic colors in the range of not-too-bright brown, blue, and green variations. Browns look well with orange, yellow, or turquoise blue striping. Sea and emerald greens, as well as vermilion, can be used to good advantage as accent colors. Green is always at its best striped with gold bronze or a brighter green, while blue seems most adaptable to a stripe of blue lighter and brighter than itself. The beauty of metallic blue can be heightened through the use of two wide stripes side by side—one light blue, the other silver.

Dark blues and green containing only a barely perceptible amount of metallic content have great depth. While these may be garnished with conventional stripings, the dark blue is enhanced by a dark scarlet stripe, and a wide stripe of bright green banded by lines of gold deepens the rich tones of dark green.

Light Metallic Colors

Very light metallic colors are hardly likely to be a problem since they are flat and uninteresting. Bright colors sometimes look well on a panel or on a show-room floor, but on the street their appearance is apt to be rather garish. They are more suitable for demonstration, show car, or commercial use than for conventional passenger cars. This is even more pronounced of maroons and reds than of other colors, for the addition of metallic content causes them to have an appearance not unlike Christmas tree ornaments.

During the past year, many shades of metallic finishes have been created for automotive use. Among these are: Shadow, a grey with a sheen of steel; Bronze-luster, grey with a greenish overlay like the patina of antique bronzes; Chancellor, the grey of English harewood; Nightshade, the velvety blue of a starlit sky; Cloisonne, a medium dark blue, containing little aluminum, but with the depth of the precious enamel for which it is named; Antelope, a pale spun gold; Praline and Sepia, dark golden browns; Verdant, the clear blue-green of a mountain lake; and Frosty, a pale, glacier green. These, and many other exotic colors, will be available to the seeker of distinction for his 1937 models.

Industrial Thermometer Book

A new blue-covered catalog compiled and published by H-B Instrument Co., Inc., 2518 N. Broad St., Philadelphia, Pa., contains 20 pages 8½x11-in., which describe and illustrate a considerable variety of indicating and recording thermometers, and their fittings, all of which are especially adapted to specific industrial uses.

American Institute of Chemists Elects New Officers

At the Annual Meeting of the American Institute of Chemists, on May 9th, at Buffalo, N. Y., Dr. Maximilian Toch, President of Toch Bros., Inc., was elected President for a term of two years. Mr. Robert Moore of the Bakelite Corporation was elected Vice President.

Cleaning Small Steel Parts

Preparatory to Finishing

by E. A. Zahn
Works Laboratory, General Electric Co.

THERE ARE several approved methods of cleaning small steel parts before painting. The most common of these is probably a hot caustic wash and rinse tank arrangement which, when properly operated, leaves a satisfactory surface for painting. The important points to observe are that the proper solutions are maintained and that the rinse tank is kept clean and hot. Heat from the water heats the steel and causes it to dry almost immediately. The cleaned surfaces should be coated as soon as possible after drying.

Parts that are too large to be conveniently handled in the wash tank should be cleaned with an oil-free solvent such as petroleum spirits or 68° naphtha. Many concerns use an expensive lacquer solvent for this work but they obtain no better results than when using an inexpensive petroleum solvent.

Carbona has also been used for cleaning many small parts but it has been found that the cheaper solvent such as petroleum spirits not only does the work equally as well, but is much safer for the operator to handle. Vapors from carbona are the direct cause of many headaches and general upset conditions.

In many cases it is necessary to machine small parts after prime coating in order to avoid masking the machined surfaces. In such cases it is necessary to remove the oil by an additional cleaning process. There is but one safe way to clean a painted surface, preparatory to recoating and that is by using the very weakest of oil-free solvents. Petroleum spirits are also suitable for this purpose. Under no conditions should a prime-coated part be washed either with lacquer, solvents, carbona or caustic solutions. After they have been cleaned in the proper way, they should be allowed to dry and then be wiped clean.

In cases of high production, the cleaning can be a part of an entire automatic system. For this work there is a great variety of cleaning materials, such as hot caustic, hot alcohol type, and vapor degreasing systems, as well as many others. It is quite difficult, however, to select one outstanding cleaning system but it is the writer's opinion that any one of these systems can be entirely satisfactory if properly applied.

Many manufacturers have adopted the use of additional sur-

EDITOR'S NOTE: This is the second one of a series of 20 short articles by Mr. Zahn.

TEMPERATURE HUMIDITY
90 90

When Spotting Out again becomes a problem and finishing costs soar with the mercury

1617
CLEAR METAL LACQUER

proves its true value. The spotting out of finishes on cast metals and the crystal spotting of oxidized finishes will be reduced and possibly eliminated by the use of 1617 — the original non-spotting lacquer.

TRY 1617 THIS SUMMER

It is crytsal clear.
Hard and durable.
Has excellent adhesion.
Does not turn green upon exposure.

Visit our permanent display at Metal Products Exhibits, Inc., Rockefeller Center, New York City

THE STANLEY CHEMICAL CO.
EAST BERLIN, CONN.
LACQUERS - SYNTHETICS - ENAMELS - JAPANS
A Subsidiary of THE STANLEY WORKS, NEW BRITAIN, CONN.

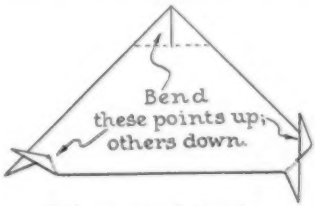
face treatment after the original cleaning. These are generally known as rust-proofing materials and have the additional advantage of giving a slightly etched surface which greatly increases the adhesion of paints. One of the outstanding advantages of this type of treatment is that it prevents the spreading of rust if the paint film is damaged.

Very small parts such as springs, bolts, nuts, etc., can be handled in any of the cleaning systems very economically in trays or baskets instead of by individual hooks.

It is extremely important that all cleaning solutions be carefully examined and tested quite frequently at regular intervals. This is especially true on fast moving automatic systems where one error might cause insufficient cleaning on hundreds of parts before it is noticed. Most of the regular systems now in use have a standard process for titrating and fixing the solutions. There is actually very little time required for these check tests, and in most cases the work of taking samples and fixing the solution is left entirely up to the operator.

To Separate Stacked Parts

FOR SEPARATING finished flat sheet stock or small flat parts, I suggest using triangular sheet metal pieces cut and bent at the corners as shown in the accompanying illustration. Scraps of sheet metal can be used. You simply lay out and cut equal-sided triangles of whatever size you need. Then determine how much space you want to allow between the stacked flat pieces of finished goods. With tin sheers, cut into each corner of the triangle about half this distance, and bend the sharp points as



Made of scrap sheet metal.

shown in the lower right hand corner of the accompanying illustration. When properly bent, one of the points will be exactly above the other at each corner, therefore offering substantial support.

The completed triangle affords a 3-point support which is so often most desirable. The sharp points make the least possible contact with the finished work. If it seems necessary or desirable later, the small indentations made by these points can be easily filled to completely hide all traces of them.—J. E. HYLER.

Morris Paint Catalog and Reference Book

A new and attractive catalog-reference book containing a wealth of information and illustrations dealing with an immense number and variety of modern materials, equipment and supplies for painters, decorators, finishers and refinishers has just been published by the Morris Paint & Varnish Co., 5161 Easton Ave., St. Louis, Mo.

The contents include valuable up-todate information about the origin, composition, characteristics and use of many products, this information helping the painters and finishers to know more about what to use and how to use it economically and effectively. The book contains 144 pages.

NOW PURE SHELLAC AND #448 MIXING

COST LESS

THAN EVER BEFORE!

● Here's good news for the wood-working industry! Now you can use 100% pure shellac—make it tough and water-resisting with Berry Brothers #448 Mixing—*at the lowest sealing cost in years!*

Actually, this superior quality combination is available at an even lower price than imitation shellac sealers and most lacquer sealers! One coat is all that's needed when #448 Mixing is used. And the sealer dries faster—seals better—and sands more easily than in ordinary methods!

Give your product the advantages of this finer process! Get top quality at a price you can now afford. A long list of wood article manufacturers are already taking advantage of this remarkable opportunity. Let us give you their names. Write also for our detailed bulletin on this inexpensive way to seal your product with best results. Address:

BERRY BROTHERS

PAINTS • VARNISHES • ENAMELS • LACQUERS
DETROIT, MICH. ★ WALKERVILLE, ONT.

soon as he has one problem solved, another stands ready to challenge him. Progress is relentless in its demands for the very best that man's mind can conceive.

Chemists solved one problem for The Steel Equipment Co., but this left us with another that engineers had to solve.

Synthetic Bake Enamel Harder Finish to Sand

Perhaps no other class of furniture has to stand as hard service as steel office furniture. Ordinary baked enamels are not hard to scratch or chip. Chemists advised us that the weak points of our former paint and enamel films were the pigments and vehicles. They were not tough enough to stand the severe use that steel furniture was being put to in offices.

One of the leading paint manufacturers set their chemists to work to produce a paint—a synthetic enamel—that would stand the racket of the modern business office, and at the same time present a better appearance than the old types of paints and enamels. But this, in turn, gave us a harder more difficult surface to sand smoothly—sanding after the prime coat and filler had been applied. If sanding was to be continued as a hand operation, then this new material would slow up our work considerably.

The Sander We Selected . . . . Results

Several types of mechanical sanders were put to work to help us solve the problem left on our hands by the paint chemists. Only one of these succeeded in producing the exact speed, smoothness of operation and dependability of mechanical action that would guarantee 100% satisfaction in finished work. Possessing the human touch of the hand plus mechanical perfection in operation, it left nothing to be desired.

Such a statement needs some explanation. General statements do not mean anything to a production engineer, but facts should mean something.

From the point of human fatigue, this sander does away with poor work periods, cramped hands and mental worry over rejected work. Workmen are proud to be operators of Speed-Bloc sanders. They can now take a real interest in their work, and they don't have that dead tired feeling at the end of the day.

Pride of workmanship and quality of product kept us to the hand sanding operation long after all other finishing operations had been mechanized. Besides our standard sanded-and-rubbed olive green finishes, we have high grade oak, mahogany and walnut grained finishes. These finishes are our pride, and are acclaimed by dealers as one of their great assets in selling our products.

Performance Tests

One of the first things we did with the mechanical sander we finally adopted was to take it apart and examine it for workmanship and materials. Similar sanders had fooled us before in this respect. This machine passed a rigid examination. Our next test was to spend hours of steady running on the hardest work we could find for it. At last we had found a sander that could "take it."

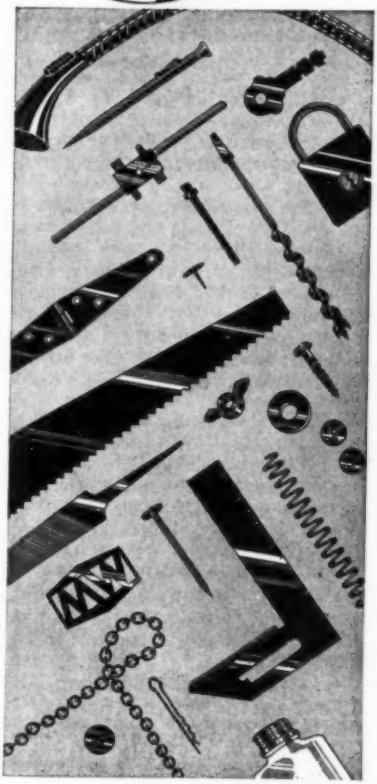
Now we had to find out what these sanders would mean to us in

the JETAL process

a simple way

to BLACKEN

Iron and Steel



THE Jetal process colors iron and steel products at low temperature, by immersion, to a uniform and brilliant black. It is a complete finish in itself and will not chip, scale, peel or discolor. It replaces more involved and expensive black finishes and forms an excellent bond for subsequent finishes such as japan, lacquers, varnishes, enamels, etc., that require high temperatures.

Ask for descriptive circular and send samples to be JETALized.

ALROSE CHEMICAL COMPANY

Executive Offices — 80 Clifford St.

PROVIDENCE, R. I.

Also Distributed by

HANSON-VAN WINKLE-MUNNING COMPANY, MATAWAN, N. J.

dollars and cents. Accordingly the sanders were connected to compressed air lines leading to spray booths, and received their baptism in the production line. They did a complete cabinet in 20 minutes that passed 100% perfect inspection. Skilled hand sanders required 45 minutes to do the same job. Each mechanical sander reduced the cost of this operation $7.67 per day.

We were afraid our experience on the sandpaper used would not show up as well. Over a period of one week we checked very carefully, and found that the consumption of sandpaper was cut in half. The savings in this respect alone would pay for the machines in less than a year.

Our machine sanding is smooth and uniform, which is important in connection with smoothing up the primer and filler coats in preparation for the final finish. We have constructed special booths for our machine sanding operations. (See illustration at beginning of this article.)

Each booth is equipped with an exhaust fan to take away the dust. The sanding operation can therefore be carried on quite close to the paint spray booths without dust or nuisance. It is also a distinct advantage for the operator to be able to work in clean, dust-free air.

Two of these sanders take care of all our work. A third sander is held in reserve, but so far this hasn't had to be called upon due to any breakdown or inability to handle the work.

Our Finishing Operations

In answer to some of the Editor's questions, we have fewer operations than the number outlined in an article in INDUSTRIAL FINISHING some time ago, because of the special oil coating on the sheets, and not so much sanding due to speed of operations, clean air conditions, and the finishing material we use. The special oil mentioned does away with chemical wash or burning off. Before painting, any weld spots are smoothed by Carborundum disc sanders. The mechanical sander is used right after the first prime coat and filler. No. 150A Durexsil sandpaper is used, and all exposed parts are sanded. The last coat is rubbed with rubbing machines (advertised in INDUSTRIAL FINISHING) using water and pumice. The final operation is to polish with lemon oil.

"Metal-Bord" Is Decorative

Something new in pre-finished metal for various ornamental purposes is announced by the American Nickeloid Co., Peru, Ill. It consists of thin pre-finished metal sheets backed up with a flexible composition material or paper. Different thicknesses and a variety of finishes are available. Free samples can be obtained by writing the company.

Dipping Water Dye

AN INTERESTING finishing material on the market today is the new dipping dye which can be used for putting a "gold plate" on such articles as belt buckles, cuff buttons, pins, safety razors, novelty jewelry, or on any other articles one would desire to give the appearance of being gold plated. This dye can also be obtained in blue, green and red colors. There is no hard labor or worry connected with the use of this dye. In gold plating, the best results can be obtained if there is a nickel plate, silver plate, or a good polished surface for a base. The operations are as follows:

1) Either dip, tumble or spray the articles with a coating of clear lacquer or a synthetic lacquer varnish, reduced about 50% with thinning solvents. It is necessary to have a thin finishing material, as each article must be completely covered, the surplus material easily draining off and leaving a smooth uniform coating. The coated articles are then put in an oven for about 20 minutes to harden the thin film of finish and make it adhere to the metal. If air dried, let it set for one hour before dipping in dye.

2) Use a wire mesh basket of any convenient size (preferably ⅛-in. wire mesh). Place articles in basket and submerge in dye for at least one minute. Take out and notice color. If a deeper color is desired, dip again; if a lighter color is desired, submerge the next batch less than one minute. After the desired color is obtained, shake the basket well so that any surplus dye will drain off and not be wasted.

3) Dip the basket containing the freshly dyed articles into a container of water, being sure the water covers them completely. Dip two or three times. This water washes off any surplus dye and also sets the dye in the lacquer film. After the basket of articles are removed from the water, place them on trays to air dry, or they can be placed in an oven, as the heat will not harm the dye.

The results obtained with this dye will surprise as well as please anyone using it, and you can run a large production with a small quantity of it.

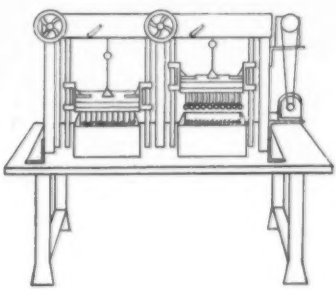
There are two colors of gold dye, red gold and yellow gold.

It is very important that the lacquer film be completely dry before dipping the articles into the dye; otherwise the dye will soften the lacquer. This dye may be used on articles of any size—if they can be completely submerged in the dye and also submerged when being washed with water. There is plenty of opportunities here for manufacturers of many small ornamental products, as this dipping dye has many possibilities. I am using it now and am getting wonderful results.

There need be no fear of the articles not being covered when they are nested in the dipping basket, as the dye is so thin it can work its way through and around all the articles in the basket, and completely cover them. The main thing is to be sure that all articles are below the surface of the dye. This dye will not scratch when the basket is being shaken to drain off the surplus dye or water, as the articles can be completely turned over immediately after being taken out of the dye bath, and the finish will not be marred.—H. H. Ford.

Dip Finishing

With Special Equipment



by Louis Bodor
Designer of Special Machinery
for the Apex Products Corp.

MACHINE DIPPING offers an economical and efficient method of finishing many small parts and products and, in some cases, a number of large items. Of course, I refer to such small articles as require a better-than-tumble finish.

During my experience in this field, I have come up against some interesting and varied problems. Here are a few examples:

A nationally known concern asked our advice in the matter of finishing tubes 48-in. in length. Up until this time we had not recommended dipping articles of a length exceeding 15-in. because we felt that anything over that length would be better "gasket finished." However, our customer's requirements were such that no method other than dipping could be used — that is, conveniently or economically.

These 48-in. tubes had to have a uniform protective finish, which was to be obtained by putting on one coat of a special finishing material. So we built a machine each unit of which could finish from 12 to 20 tubes (depending upon their diameter), the 48-in. tubes being dipped in about 15 minutes. The one coat of finishing material gave a smooth high-luster finish.

A dowel and bead each dipped with three colors; and a shaving brush handle dipped in two colors

Shortly afterwards we had an inquiry for a machine to finish bicycle and automobile pump tubes. We checked the customer's finishing methods and then guaranteed a saving of at least 40% in costs. Since these tubes were metal and of considerable weight, the machine had to be strongly built . . . compact, easily installed and portable. The results, in this case, exceeded our expectations. The company advised us later that they were saving about 60% over former costs; production was speeded up and the finish was better in every respect.

Another problem submitted to us was to dip finish small slotted metal boxes. At first we thought this would be impossible; but we experimented and experimented. Finally we found that by dipping the boxes at a certain angle and with a special lacquer, the results met with the manufacturer's approval and came within the allowable finishing costs.

Now we feel that

First Choice!

HILO CLIX

QUICK BAKING SYNTHETIC

A manufacturer of metal tools makes Hilo Clix Red his choice after conducting tests with a number of finishes.

Your need, too, can be amply satisfied with the results Clix produces — a hard, tough, elastic coating, porcelain-like in appearance. It adheres tenaciously to wood or metal and grows tougher with age.

Hilo Clix covers perfectly in one sprayed coat and bakes at the low temperature of 225°F. in 1 hour.

You pay us nothing for a liquid sample of Hilo Clix. Just write for it and the sample will be delivered promptly free of charge. All we ask is that you try it — you'll see the finest one coat finish you've seen in years.

HILO VARNISH CORPORATION

HILO

73 Years Experience in "Better-The-Finish"
42-60 Stewart Ave. Brooklyn, N. Y.
Chicago — — Boston — — Philadelphia

Varnishes Enamels Japans Lacquers

almost any odd-shaped small article, and many large pieces, can be machine dipped with the proper procedure, materials and equipment. Important points to consider are as follows:

1—Speed of dipping.

2—Angle of dipping.

3—Correct dipping fixtures.

4—Viscosity of material.

5—Proper drying method.

When all the above factors are duly considered the results should be: 1) a good even covering; 2) no waste of lacquer; 3) no drips, sags or runs; 4) minimum labor cost, and 5) complete control over uniformity of production. Buttons, dowels and other small articles can be finished with two, three or more color effects—and novelty and pearly lacquers can be applied with excellent results.

Too much credit cannot be given to the lacquer manufacturers who are constantly improving their finishing materials. We owe a great deal to their fine cooperation, because without it we certainly would not have been able to meet some of these seemingly impossible requirements. We have had requests for alcohol-proof, fireproof and acetone-proof finishes, and we have had to coat celluloid with a lacquer that would not warp the article.

Our problems have included the finishing of metal, bakelite, composition materials, etc., and in most cases there was a requirement specifying that the finishing must be low in cost, which meant that usually one coat of material had to be sufficient. So we pass these problems on to the lacquer manufacturer, while we try to figure out the best method of application, and thus progress is made.

Furniture Finishing

MR. MCFADDEN'S article on page 8 of May INDUSTRIAL FINISHING, regarding the above subject, illustrates modern procedure for willow wood novelty furniture, and brings out some very good points. The comments reveal that the method outlined is "practically a 2-day finish." However, a third day is required for either rubbing or packing. I know of concerns that are actually on a 2-day production schedule using . . . . oil stains.

In small or large factories, with quantity production, small novelties and occasional pieces made of gum, willow, birch, maple or tupelo can be dipped in the new quick-coating pigment-wiping oil stains, wiped off, and coated in one hour. Larger pieces can be sprayed or brushed and coated in one hour. This literally saves one day and makes the finishing room double in size by eliminating the necessity for stain drying over night and taking up space in the finishing room waiting for first coating. Thus all pieces stained up until noon can be sealed and finished the same day, and rubbed and packed the second day. For special rush jobs, lacquer is used so that in these instances a one day finish of quality is available—all this with no increase in finishing material costs, and a decided saving in time, space and overhead expense.—H. E. CUDNER (Cudner & O'Connor Co.).

"Industrial Dust Control Through Exhaust Systems," is the title of a 54-page book by W. O. Vedder of the Pangborn Corp., (blast cleaning) Hagerstown, Md.

Why Is An Artist's Model An Artist's Model?

Artists select for their models women who know how to be beautiful . . . who maintain graceful figures . . . who keep their skin clear and lovely . . . who know the art of makeup. In other words, artists' models are selected because they know the value of a beautiful finish.

We know the value of make-up as applied to commercial things . . . and how to finish products in a way that they too will be selected by buyers because of their beauty and smartness.

Send us a sample of your product for a studio analysis and we will show you a sales-stimulating finish. There is no charge to reputable firms for this service . . . and there is no obligation. Write for details.

Rockford Varnish Co.

ROCKFORD, ILLINOIS

Wood Graining

Referring to the inquiry of H. Truck and Coach Co. for a process of wood-graining the interiors of buses (May issue, page 73) I suggest doing this with transfer graining paper. First, prepare the surface to be grained by smoothing and cleaning it, and then apply a suitable flat ground color coat. The color will depend upon the wood you plan to imitate. You can purchase good ground colors already made up, or your finisher can mix up some for the job.

The transfer graining paper comes in rolls, one manufacturer advertising it "in double rolls 18 yards long and 26-in. wide, representing every variety of hardwood. From two to five copies can be obtained from each piece of paper."

Cut your paper a little larger than the space you have to finish. You will need a smooth flat table or bench on which to lay out your paper and dampen the back. You wet the back of the paper with water and let it stand a few minutes until the mixture has soaked into the transfer color. Now lift the wet paper carefully and lay it or hang it into position. For pressing the moistened paper flat and firmly to the prepared ground colored surface, I prefer to use an old stiff paint brush. Brush the entire surface until you have a perfect transfer. After a little practice a good workman will gain confidence and become quite skillful at this work. Don't let your paper get too wet, or your transfer color will be mussy and not give a good impression. It's best to experiment a little before starting on the real work.

Questions « Answers

After you have made the printed impression from transfer paper you are ready to apply your graining color of oak, walnut or mahogany, or whatever wood you are reproducing. This color must be skillfully applied and well brushed out, as a little goes a long way. Here again you should experiment some before going ahead on the real job. After some practice a clever finisher can do such a splendid job of graining that it will be hard to distinguish his work from the real thing.

When your graining color has dried you are ready for your finish coat of whatever you may want to use, for example, clear varnish or clear lacquer.—J. K. COOPER.

Finishing Brass Pencil Tubing

In reading of the difficulty experienced by "B. E. A." (as mentioned in March INDUSTRIAL FINISHING, pages 56 and 57) namely securing an enamel finish on brass tubing that will be both hard and flexible and will not crack or flake in divers places, it occurs to me that the type of finish applied may be perfect but the surface has not been properly prepared to receive it.

It has been my experience that brass, copper, bronze and plated

ADVERTISING PAGES REMOVED

metals present surfaces to which paint, enamels, lacquers and primers will not adhere satisfactorily unless these surfaces have been slightly etched with a chemical solution.

This need not be an expensive operation. By selecting a sample of the metal and applying a few simple tests, an experienced finisher, exercising good judgment, should readily arrive at the source of the trouble and develop a finish that could be guaranteed both for durability and appearance. There are several very good commercial cleaners on the market today, any one of which will be found suitable for this tubing—or a 3% solution of acetic acid might be all that is required.

However, several essential details must always be remembered, especially in attempting to apply enamel finish to "bright surfaces." In the order of their importance they are as follows:

1) Be sure to always maintain the cleaning solution at its proper working strength.

2) Always remove all traces of the cleaner from the work with clean water.

3) Make certain that all moisture has been eliminated before applying the finish—by oven-drying if necessary for porous castings.

4) Never, under any circumstances, allow even clean hands to touch the cleaned metal surface before application of finishing material. In many instances so-called failure of the finish, flaking or chipping, is caused by and starts at the point where it has been handled or finger marked. Many automobile fenders rust and chip at edges due in part to this carelessness.

5) Apply the finish as soon as possible after the cleaner has been removed and the surfaces to be enameled are dry.

If you are not familiar with the particular product you are applying to the surface, consult a reliable manufacturer of finishing materials. The manufacturer's laboratory will recommend the best material for any particular finish, even to the point of developing a new formula if necessary.

By observing these few simple rules and carefully supervising the application of the finishing material, you should get satisfactory results in cost, appearance and durability.—GEO. A. ENDOM.

Pigment Wiping Stain

A problem has developed in our finishing room with a pigment wiping stain which we are using. It is giving us considerable trouble. The pigment wiping stain is composed of siennas and umbers in oil, cut into V.M.P. naphtha. We have been using this stain for a number of years and until a short time ago were apparently able to use a batch for an indefinite time, or until it was used up. Now, when we mix a new batch it is perfect when fresh but after about the seventh day the colors go out of solution and the stain is worthless.

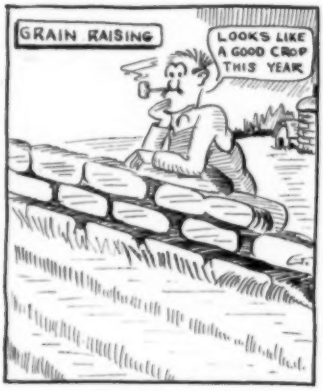
The separation apparently does not take place gradually but occurs within a few hours. We have checked batch after batch to see that it is made in exact accordance with our formula, but we always get the same result—a useless mixture after about eight days.

The service man from the house

from which we buy our lacquer was here a few days ago and went into the problem with us and, while he did not commit himself as to what he thought might be wrong, he did say that none of the material we had in our finishing room could injure the stain if it happened to be mixed in a batch accidentally. The tank in which the stain is mixed and used is cleaned out once every two or three weeks so we are sure that dirt is not the cause of our trouble.

The following information may have no bearing at all on our trouble but we submit it for what it is worth: A steam pipe passes under the tank and keeps the stain at a temperature at about 60°F. all the time. These are all the facts that occur to us at the present time but if there is any information which you would like to have, submit your questions and we will answer them fully.—N. Q. Co.

We believe you should make up fresh bathes of stain more often, clean your mixing tank more often, and keep the temperature of your mixture at 65° to 70°F. Do this and use clean high grade materials, and you should have no trouble.—I. F.



Finisher's Tack Rags

EXPERIENCED finishers know quite well what a tack is, but new men in the finishing game and many executives are not so sure about what it is or what it is used for. The tack rag has a useful purpose in connection with high class finishing. It is used to pick up dust, lint, sand particles or any foreign accumulation on the surface to be finished, immediately preceding the application of a finishing coat.

A properly smoothed surface, carefully tack-ragged and then finished with strained enamel, presents a final finish of porcelain like smoothness and gloss, whereas without these precautions the surface may show up specky or pebbly and require very fine sanding or rubbing to smooth it out, this in turn killing the gloss.

Today you can buy ready prepared tack rags chemically treated and made scientifically (11 operations, one manufacturer claims) to retain a permanent "tack" which the manufacturer claims will last indefinitely. After such a rag has been laid away or is out of service for some time, if it's found to lack sufficient tackiness, its original good qualities can be restored by putting it in a warm place for a few minutes.

The way to use a tack rag is to wipe the surface gently just before applying enamel, varnish or lacquer.—FACTORY FINISHER.

FASTER PRODUCTION AT LESS COST . . . . .

The new Paasche UBCH High Production Airbrush has everything. Greater speed. Smoother coverage. Finer atomization. Greater ease of handling. You get more continuous hours of fast production and finer results . . . at less cost with this Paasche airbrush. Write for information about this latest airbrush development.

Paasche Airbrush Co. 1917 DIVERSEY PARKWAY CHICAGO, U. S. A.

Pioneers of Manual and Automatic Airfinishing, Aircoating, airrubbing, portable airpainting units, airfinishing booths, and fireproof ventilating equipment.

What's New « «

Small But Efficient Spray Outfits

Two new low-priced spray-painting outfits are announced by the Gast Mfg. Corp., 202 Mathieu St., Bridgman, Mich., pioneer manufacturers of spray-painting equipment for professional painters. These machines, although of unique design, incorporate such nationally known Gast features as rotary-type compressor, rotor blades which take up their own wear, etc.

The manufacturer claims that these machines will deliver more pressure and more air volume per pound of weight than any other units on the market.

The Gast "Zephyr" is equipped with ¼-h.p., 1,725-r.p.m., G. E. motor, Gast rotary-type ball-bearing compressor, and Gast type "R" gun with external-mix nozzle. The compressor delivers 2½-cu.ft. of free air per minute; has cooling fan, air-inlet filter, outlet filter, and safety valve. . . . No pulsation of delivered air; no vibration; no compression loss through piston or cylinder wear; no diaphragms to replace. Blades in the rotor take up their own wear, and are easily and economically replaced after years of service.

The spray gun is adjustable for flat or round spray. Wearing parts are made of stainless steel and monel metal; has one-quart pressure-feed aluminum cup.

The Gast "Air Champ" has 1/6-h.p. G. E. motor, rotary type compressor and internal-mix gun nozzle; delivers 1½-cu.ft. of free air per minute. Both outfits are excellent for a variety of light production work, touch-up work, repair work, light maintenance painting, finishing, etc.

The "Zephyr" outfit weighs 40-lbs. complete. Notice convenient carrying handle.

GOOD COVERAGE IN ONE COAT

THERE is sound economy in using Walker's Metallic Finishes. A beautiful finish always increases the sale of merchandise; it gives it eye value.

Manufacturers of electrical goods, novelties, toys, clocks—similar metal objects, use our New Metallic Pyroxylin Enamels with highly satisfactory results.

These enamels have excellent adhesive qualities on nearly all surfaces, and produce a lustrous finish. A single coat gives good coverage.

Metallic Pyroxylin Enamels are furnished in Gold—in the following shades—Pale, Roman, Green, Deep, Antique. And in Silver, Pearl Gray, Old Rose, Statuary Bronze, Brass, Pastel Shades in Blue and Green. Also in Gun Metal and Black.

Send at once for Color Chart or a finished sample of our New Metallic Pyroxylin Enamels.

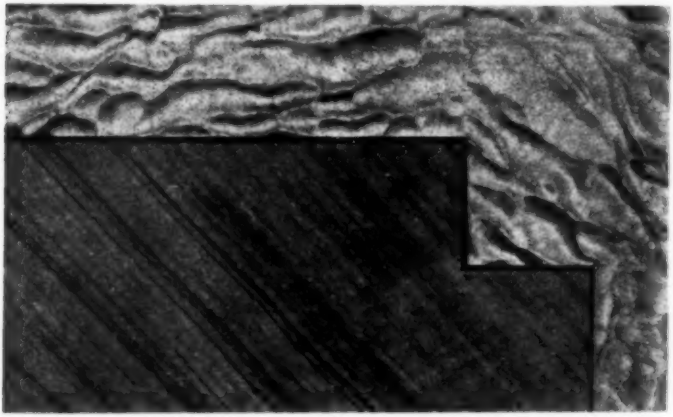
The Emblem of QUALITY in Finishes

HVWCO

We invite manufacturers with finishing problems to take advantage of our complete laboratory facilities. We invariably find the solution to finishing difficulties.

H.V. WALKER CO.

Offices and Plant - - - **ELIZABETH, NEW JERSEY**



Typical example of figured wood grain and inlay reproduction by silk screen process.

Photo Stencil Graining

An example of a piece of wood graining and inlay work, produced by the newly developed photographic silk screen process, is shown in part by the accompanying halftone cut.

The possibilities of reproducing attractive matched figured veneer effects in different woods, with or without inlay or marquetry ornamentation for furniture tops and fronts, wall panels, etc., are said to be practically unlimited.

According to an announcement by the Naz-Dar Co., manufacturers of silk screen supplies and equipment, 4014 N. Rockwell St., Chicago, Ill., the company is in position to supply the silk screen process finisher and printer with accurate photographic silk screen plates from which to print the finest detail, as in print type, pen and ink drawings, or photographs by the halftone process. The photo stencils are easy to operate. Each screen plate prints perfectly and reproduces copy exactly with clean-cut lines. If handled properly, from 5,000 to 10,000 impressions may be secured from each screen. Perfect register is assured on multi-color jobs.

The customer must submit his own copy in black and white. Since the camera reproduces faithfully, an excellent finished original is essential. Copy need not be exact size, as the Naz-Dar Co. is prepared to enlarge or reduce same.

Naz-Dar photographic silk-screen plates are made in all sizes up to 28x44-in. Screens are delivered, mounted ready for printing.

Pressure Switch

A new pressure switch for the automatic control of small compressors and fluid pumps is announced by Cutler-Hammer, Inc., N. 12th St., Milwaukee, Wisc. The principal features of this switch are its compact all-metal "airstyled" enclosing case; flexibility of application, long, trouble-free operation; full automatic action; protection to motor; ease of wiring, adjusting and inspecting.

Inverse time limit overload protection is obtained by the C-H Eutectic metal thermal overload relay,

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To insure these qualities for users of Du-Pros Strictly Pure Shellac every gallon is freshly made when shipped. And every gallon is double processed to secure the most complete solution.

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JAMES B. DAY & CO.
CHICAGO

operating directly on the contact mechanism. The relay gives protection to the motor during starting and running—allows an ample time interval to take care of starting inrush and momentary overloads without tripping. A red band on the reset button indicates when the switch is open and equipment shut down; pressing the button resets the overload, places the starter back in service. By simply pulling out the reset button the equipment can be shut down.

Q. C. P. W. Oil Stain

A quick-coating pigment wiping oil stain that dries thoroughly in one hour is now available in the most desired shades. According to the manufacturer, Cudner & O'Connor Co., 4335 W. Kinzie St., Chicago, Ill., it marks a major improvement in finishes for modern schedules of finishing.

Q. C. P. W. oil stains are the result of years of experience in stain manufacture, retaining the advantages of the old type of pigment oil stains and at the same time overcoming the disadvantages, at no premium in price. Outstanding features of Q. C. P. W. oil stains are:

1) Permanent, non-bleeding colors; any shade of walnut, maple and brown mahogany.

2) Pigments remain in suspension; little or no stirring required.

3) Strong colors; will take considerable reduction with naphtha.

4) Fills as it stains.

5) Excellent penetrating and uniforming qualities.

6) Reduces wiping rag costs.

7) Rich, transparent, deep tones.

8) Excellent adhesion of succeeding coats.

9) Spray, dip or brush.

10) Wipe in five to 10 minutes. Careful skillful work at this point will produce a 2-tone and glaze effect.

11) May be coated with sealer or shellac in one hour.

Adjustable Mixer

The "Pailmix" illustrated here is a simple crank-handle stirring device that easily clamps over the open top of any 3½ to 5-gallon pail or open-head container. It offers a quick

Simple and easy to use.

easy way of stirring paint or other finishing materials. The manufacturer, C. E. Farrington, Phoenixville, Pa., says:

"Instead of 65% lost motion with a stick in a pail that slides about on the floor, one hand holds the pail firmly by the leverage of the Pailmix 'grip handle' while the other hand easily makes the paddle revolve 50 to 100 times per minute, whereby the paddle travels 125 to 250-ft. per minute with the entire mass in constant motion."

Waterproofing Liquid

A new waterproofing liquid, prepared from a combination of thermatically-processed oils by a recently developed process, has been added to the line of Valentine & Co., 386 Fourth Ave., New York, N. Y., and is now being marketed under the name of Val-Oil. Although designed primarily to prevent the oxidation of metals, this new product has many other uses and serves as a perfect protective coating for iron, wood, steel, cement, brick or stone, accord-

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Liquids & Tonics
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Lacquers
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ing to a prepared statement by the company. Moreover, it can be used as a primer and rust preventive on metal and as a sealer for wood or plaster.

Val-Oil is easily applied by spraying, brushing, dipping or wiping, and may be air-dried or baked. It sets to touch in one to 1½ hours and dries to a hard, tough, but elastic film over night. This new product is said to be practical for use as a bronzing liquid, radiator finish or paint drier, as well as a vehicle for shingle stains. As a sealer, it can be mixed 50/50 with flat wall paint. It will protect against the alkali and other salts present in the plaster. On cement floors it can be reduced 15% to 25% with turpentine or naphtha, without impairing its volume, and on all types of woodwork it can be used either as a priming coat or as a preservative. It has also been applied to fabrics as a waterproof coating. Fishermen can dip their nets in Val-Oil to waterproof them.

Benite-Black Finish

A new finish for use on the black presdwood tops of counters, tables, sinks, etc., is announced by The Bens' Chemical Co., Jackson, Mich. According to this company Benite-Black produces a finish that is impervious to water, alcohol, grease and mild acids. A 2-coat treatment may be scrubbed indefinitely with water and a white cloth without discoloring the cloth.

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Manufacturing Quality
GOLD and SILVER
Colored Bronze Powder
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The O. Hommel Co., Inc.
Pittsburgh, Pa.

Colloidal Mixer

The Crane Colloidal Mixer, announced by the Colloid Equipment Co., 50 Church St., New York, N. Y., has been designed for the mixing and dispersing of pigment colors and

Ball bearings are used throughout.

clays, for reducing the viscosity of fluid mixtures and to aid in the solution of solids. It will process any solution which will flow through the feed pipe and will smooth out gums, resins and fillers. Emulsions are made smoother through its action and the size of the globules is reduced.

The machine is simple in design and rugged in construction; has no extremely fine clearances, and no adjustments need be made once it is put into operation. The shaft, notched discs, and cylinder are regularly cadmium plated, but special metals can be supplied for special uses. All other metal work is galvanized. All parts are accessible for cleaning and the construction is such that all pockets and dead spots are avoided. The unit is powered with a ¾-h.p., direct-connected motor.

The wide-open capacity of the unit is 250 gallons per hour for a medium viscosity solution. If an extremely fine dispersion is desired, the speed of passage is reduced by throttling the outlet. Where large quantities are handled in continuous production, a float valve control is used to maintain proper level in the hopper.

Yesterday's Experience Creates

TODAY'S LACQUER

It is said "Experience is the best teacher." Nowhere is this truer than in the making of lacquer. In this business, where a lacquer manufacturer is called upon every day to supply finishes for thumb tacks and locomotives and thousands of articles in between these extremes, there is nothing that can take the place of experience. • Our sixty years in the lacquer industry have taught us much and have enabled us to solve many a knotty finishing problem that would have stumped a less experienced manufacturer. These years of experience have also taught us how to make and constantly improve standard grades of lacquer. • The next time you are in the market for a finish, we hope you will call upon us and avail yourself of "Yesterday's experience that creates today's lacquers."

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Aspro Metal Finish

A new type of metal finish possessing some unusual qualities that recommend it particularly as a finish for industrial machinery and similar purposes, has just been introduced by The Asphalt Products Co., Grand Central Terminal, New York, N. Y. Although of a modified asphalt base, it has valuable qualities that are not ordinarily associated with finishes of this type, according to the manufacturer.

The new product, known as "Aspro Metal Finish," is obtainable in black and the darker shades of gray, red, green and brown. It shows remarkable resistance to the destructive reagents commonly encountered in industry; is insoluble in oil and the lighter distillates of petroleum. Caustic and other alkaline solutions, cutting compounds, alcohol and most of the acids in commercial use have no effect on it. The finish is highly resistant to the effects of water, sunlight and heat (temperatures up to 400°F. do no damage to it).

Aspro finishes may be applied by spraying or brushing and may be air-dried or baked. They dry to the touch in four hours and attain maximum hardness in 24 hours. They have a smooth, glossy surface that is harder than is usually the case with asphalt-base finishes. They have sufficient resiliency to prevent checking, cracking or peeling, and elasticity that permits expansion and contraction with changes in temperature.

The manufacturer claims unusual hiding power and excellent adhesion to metal surfaces. Of particular interest where safety against fire is a consideration—these finishes are non-fire-supporting and when submitted to extremely high temperatures, merely smolder without bursting into flame.

Counter-Top Black Finish

The Bens' Chemical Co., Jackson, Mich., announces a new black finish for use on the black tempered Presdwood tops of counters, tables, sinks, etc. It is said to be impervious to water, alcohol, grease and mild acids.

Commercial Solvents Philadelphia Office Moved

On June 1 the Philadelphia office and warehouse of the Commercial Solvents Corp. were moved from 701 S. Front St., to more convenient and commodious quarters in the Terminal Commerce Bldg., 401 N. Broad St. A complete line of industrial alcohols and solvents will be carried in this warehouse for the convenience of manufacturers in the Philadelphia trading area. Mr. E. T. Butler is in charge of the Philadelphia Branch.

Improved Paint Announced

Making public for the first time the results of recent experiments in the field of paint chemistry, Dr. J. S. Long, prominent research technician, announces the development of a new method of processing oils which go into the manufacture of ordinary house paints. The new process, developed by Dr. Long and his associates in the laboratories of Devoe & Raynolds Paint Co. in Louisville, Ky., is said to give paint an unusual resistance to conditions which serve to bring about checking, cracking, peeling and fading of ordinary paint products.

Dolan's DU-BAR Bleach

Wateroil Stains—

All the newest shades. Light-fast, quick-drying, Non-Grain-Raising. Clear, clean colors. More finished surface per gallon — economical and uniform finish.

Don't forget "Dolco-Real-Fill Fillers," Light-Fast Shading Stains and Dolan's "Unquestionable Quality" Lacquers and Sealers.

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The Country's Leading Makers

FINISHING MATERIALS AND
FINISHING METHODS USED IN

Electrical Insulation—I

by J. W. McHugh
Schenectady Varnish Company

FEW PEOPLE realize the very important part insulating varnish has played in the progress of the electrical industry over the last 40 years. The development of the electrical art from the cumbersome, slow-speed, low-voltage motors and generators to the compact, efficient, high-speed and high-voltage motors of today is one of the great industrial miracles. The harnessing of the water falls, the generation and transmission of unbelievable electrical voltage, the high-speed automotive and vacuum cleaner motors, and the tiny motors which run our clocks with a fraction of a horsepower—all are dependent on some form of insulation to keep this thing called electricity within bounds, and make it an efficient controlled servant of industry.

The chief kinds of insulating materials today are varnish, porcelain, wax, bakelite, paper and cloth. Of all these, varnish is perhaps most widely used and best adapted for many different purposes. However its chief application is for the insulation and protection of electrical coils. Varnishes of widely different composition and properties are used, each with a specific purpose in mind, such as waterproofness, oil resistance, flexibility or binding strength.

In addition to preservation and appearance features, these clear and black varnishes (air-drying and baking) for electric wiring and coils must have the important characteristics of good insulation qualities; also, waterproofness, oil resistance and binding strength. In some electrical work flexibility in the varnish is desirable, but in others it is not.

In this first article, the author explains the characteristics and essential requirements of various types of insulation varnishes for new production work and repair shop work, in stationary, heavy slow-speed and light high-speed electrical apparatus.

● ● ●

The varnish industry has made great strides in the last few years in improving the insulating var-

SURFACERS

PORES NEED FILLING for smooth-textured attractive finishes. Presdwood, celotex, natural woods, rough metals and porous compositions need quick-drying, easy-sanding, high-bodied surfacers—in short, our CEL-U-LAK Surfacers.

These have unusually high body, coupled with low viscosity, permitting a heavy application by spray; air dry to sand in 1½ hours, force dry at 125° for 20 minutes. They are ground finely and have phenomenal adhesion and resistance to moisture.

CEL-U-LAK Surfacers are standard in white, ivory, dark grey and red. They have for 6 years been an outstanding successful item in our line. We suggest you examine it for your requirements.

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nishes to effect savings in the way of quicker baking time, to make a varnish whose life will be 20 years instead of five, and varnishes which are flame and fire resistant. All of this has been made possible by continued search on the part of the varnish manufacturer in co-operation with the electrical industry for newer and better products and methods of formulation.

Kinds of Varnishes

The varnishes of today can be classified under three headings:

1. Clear Insulating Varnishes
   (a) Baking; (b) Air Drying
2. Black Insulating Varnishes
   (a) Baking; (b) Air Drying
3. Spirit Varnishes

Clear Insulating Varnishes

Clear varnishes were formerly used to a much larger extent than they are today. The trend is definitely towards the black types which are attractive for their cheapness and somewhat better properties, although there is a difference of opinion here. Clear varnishes are essentially composed of a fossil gum or resin, a mixture of drying oils, such as linseed or Chinese wood oil, and a petroleum thinner. Coal-tar thinners, such as benzol or toluol, should not be used on account of their possible toxic effect upon the workers, and their solvent action on enameled wire.

The clear baking varnishes can be roughly divided into two groups: 1) For use on large equipment such as power transformers and some large motors, and 2) for use on small high-speed equipment such as used in the automotive field, vacuum cleaners and kitchen mixers.

For group No. 1, a very flexible, long-life varnish is required —one whose film will remain intact in spite of great expansion and contraction due to temperature changes, and also movement due to surges of current through the coils. Here flexibility is the prime requisite; it must be had even at the expense of quick drying. Many of the large varnish-treated transformers operate in a bath of transformer oil which acts both as an insulating and cooling medium. Absolute insolubility in this oil is a necessity here.

For group No. 2, an entirely different set of properties are needed. The motors are small and they operate at speeds ranging from 1500-r.p.m. to 10,000-r.p.m.; they are tested at even higher speeds. Here binding strength, not flexibility, is the chief characteristic desired. Due to the high speeds, an enormous centrifugal force develops in the armature and tends to throw off or loosen the individual coils. To combat this it is necessary to have a varnish that is tough and resistant to movement of any kind, so that the coils will not shift and cause shorts.

Due to the high speeds of motors, any undried varnish inside the windings will be thrown off. A great amount of work has been done in an effort to obtain good internal drying in a closely wound coil.

Many varnishes tend to soften at elevated temperatures. The clear varnishes, properly formulated, show little tendency to relax at high temperatures if they have been well baked out. The particular balance of toughness, binding strength, internal drying, and freedom from relaxation is

one very difficult to meet, but is one which is necessary to fulfill for the requirements of the present day high-speed motors. Here the clear varnishes have a distinct advantage over the blacks.

Clear Air-drying Varnishes

These have found little application in the insulating field today, and are used only where baking facilities are not available. For most insulating jobs they are not recommended.

Black Insulating Varnishes

The black baking varnishes are the largest group in the insulating field, and comprise a great number of varnishes with widely different physical properties. These varnishes are generally composed of gilsonite, petroleum or vegetable pitches and linseed or Chinese wood oil. Due to the more or less permanent flexibility of these pitches, most black varnishes are relatively low in oil content, but in spite of this they have flexibilities equal to or greater than the general run of clear varnishes. The oxidizable nature of the resin used in the clear varnishes causes them to tend to become brittle under high heat or severe aging conditions sooner than the black varnishes.

Today, with the exception of certain types for equipment mentioned previously, black baking varnishes are used almost universally throughout the industry on armatures, stators, and field coils. Coils treated with black varnish have a great advantage of appearing to be better filled and insulated than if treated with a clear varnish which is more or less transparent to the eye. There are, of course, many kinds of black varnishes, varying from slow to fast baking and from brittle to flexible.

For the most part the blacks are somewhat more waterproof or, in terms of the industry, they will show a higher dielectric test after immersion in water than clear varnishes. Most black varnishes do not have as great resistance to transformer and lubricating oils as do the clears.

One very important advantage black varnishes have over the clears is that in contact with copper, they do not tend to corrode the surface. This is particularly true when the varnish is not completely dry or oxidized, as is frequently the case in the interior of the coil. This corrosion which shows up as a green stain on the cotton winding or tape is, for the most part, not harmful, but in some isolated cases it does cause trouble. This seems to be due to the organic oil acids in the varnish, these acids being present in greater quantity in the clears than in the blacks.

Black Air-Drying Varnishes

This group of varnishes has a variety of uses—for small field coils, repair shop and general maintenance work. They are usually less flexible and have less resistance to oil than do the black baking types, but for use as the finishing varnish over a coil already treated with a baking varnish, or on coils which are stationary or which are not subjected to shock or movement, they fill a definite need. For most types of field and radio coils a black air-drying varnish is all that is required for satisfactory results.

Black Spirit Varnishes

Spirit varnishes are thinned with denatured or wood alcohol

and will dry in about 15 minutes. They are absolutely insoluble in oil of any kind and dry with a brilliant gloss which greatly improves the appearance of the coil. As they are not very flexible, they should be used over another varnish which will give the coil the needed flexibility.

The final installment of this interesting article (Part II) to appear next month, takes up various methods of applying the varnish (brushing, spraying, dipping, pulling a vacuum in coils before impregnating, etc.) baked finishing temperatures, ovens for baking, and methods of testing insulation varnishes.

Hammer Handle Finish

THE BEST wood for hammer handles is clear young-growth straight-grained hickory or ash. For a strictly natural finish on these wood handles, I suggest one dip coat of clear lacquer sealer; then polish on a canvas belt with carnauba wax.

A finish very close to this "natural wood clear" consists of a white lacquer applied by dipping. The white lacquer enamel I have in mind contains very little white pigment, so that the natural wood grain and color show through to a considerable extent, giving a clear attractive effect.

Other popular finishes include transparent greens and mahogany browns through which the natural wood grain is easily recognized.

By way of variation, some manufacturers finish their hammer and hatchet handles in two colors, the color division being either at the mid length of the handle or about two thirds of the length back from the steel. Popular combinations are ivory and black, white and brown, white and red, etc., the darker color being at the grip end of the handle. These 2-color finishes are usually applied by dipping, the ends of the handles being stuck to the sharp points of a dipping rack which will accommodate anywhere from 12 to 24 handles at a time. The light colors are dipped first a little beyond the dividing color line. When dry, the other ends of the handles are dipped into the darker color. Care must be exercised in the last color dip so there will be a clean-cut line of division between the two colors.

The lacquers and enamels used are semi-gloss in luster. After the color has been applied and is dry, the surfaces of the handles are usually waxed and polished by holding them against a moving wax-filled, canvas belt.—J. E. GREENE.

Comments by The Sherwin-Williams Co. Technical Department follow:

We have checked over the article on "Hammer Handle Finish" and find only one point that we question.

In the fourth paragraph the author states that the light colors are dipped first a little beyond the dividing color line, and when dry the other ends of the handles are dipped into the darker color. This we believe to be contrary to usual practice because it involves re-pegging the handles.

Our understanding of the procedure is that the light color is applied to the entire handle and then when dry the contrasting and darker shade of green, red, or whatever is selected, is applied over the lower portion of the handle. This means a double coat at one end and consequently a greater consumption of finishing material, but this is less costly than the labor of re-pegging the handles to dip one color on one end and another color on the opposite end.

The FILWHIRL ENAMELER, pictured here, is gaining tremendous popularity in several plants because of its performance in coating small parts—better, faster and at less cost. If you manufacture items such as nuts, bolts, handles, hair pins, wood and metal toys, golf tees, and the like, you can use the FILWHIRL to advantage in coating them. Write for facts!

THE LEON J. BARRETT CO.

Grafton Street Worcester, Mass.

Coating Small Parts

Just send us samples of your products for coating in this machine, and we will return them for your inspection, together with cost figures, etc. Wouldn't you like to coat as many as 120,000 to 225,000 articles in an 8-hour day, as some are doing; and on real small items, finish as high as 600,000 per day? Large savings in dipping materials affected too. Learn more about this wonderful machine. Write us!

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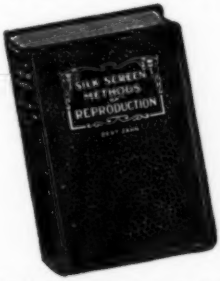

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THIS new book is intended for Sign Painters, Card Writers, Display Men, Furniture Manufacturers, Novelty Manufacturers, Glass Etchers and For Domestic Use.

Every detail of the silk screen process is presented clearly in detail. All equipment is fully described and its use illustrated. All materials needed in the various kinds of silk screen work are mentioned with respect to their use to advantage. Estimates of costs and prices to charge are given.

Practical Publications, Inc.

222 East Ohio Street Indianapolis, Ind.

Letters from Readers of "Industrial Finishing"

Editor's Note — These letters have been promptly answered and all of the inquiries have been referred to advertisers in the magazine. They are published here to indicate or suggest certain interesting trends of thought and activity in the industry, and to encourage further inquiries, comments and suggestions. The names and addresses of firms or individuals whose letters are published here may be had by writing to this office, or letters addressed to them in care of this office will be forwarded immediately.

Heat-Proof Fnish

Please advise us if there is any known finishing material, either lacquer, synthetic lacquer, enamel, varnish or surfacer that can be applied to metal and withstand from 450° to 500°F. continuous heat. Of course we refer to the class known as soft enamels (not vitreous enamels) either baked or air-dried, and would greatly appreciate any information obtainable in regard to such material which can be obtained in various colors.—H. K. N. Co. (Etched Nameplates and Dials).

To Handle Paint Drums

A short time ago, in one of the industrial magazines, I saw an ad. for a truck to handle 55-gallon paint barrels in paint shop. At the time we were not interested in the purchase of these trucks, but since then we have found that we could use them to advantage, but I am now unable to find the ad. If it is possible, would you please send us information as to where we can purchase hand trucks to move paint barrels and place them on a platform 14-in. above the floor?—W. & F. Mfg. Co. (Filing Equipment).

EDITOR'S NOTE: Perhaps you saw the ad. of Lewis-Shepard Co., Boston, Mass.

Dipping Machines

In your April issue we notice on page 44 a dipping machine. We would appreciate your putting us in touch with the manufacturer.—E. D. Co. (Makers of Good Furniture).

EDITOR'S NOTE: The one described and illustrated in April issue is a product of the Northern Machine Mfg. Co., Wausau, Wisc. Others are C. W. Smith, 40 Market Ave., Grand Rapids, Mich; and Apex Products Corp., 445 W. 45th St., New York, N. Y.

Pearl and Crackle Lacquers

We have been referred to you by Berry Bros., paint manufacturers, as a possible source of information regarding two lacquer products, namely pearl and crackle lacquer. The latter is sometimes known as "Crackno". We would greatly appreciate any information you may be able to give us regarding these lacquers and the name of the manufacturers.—N. T. Q. Co. (Arts & Crafts Dept., State Prison).

EDITOR'S NOTE: The names and addresses of several concerns have been given in reply to this inquiry.

Celluloid Finish

We are anticipating the manufacture of items requiring a celluloid finish. Would you, therefore, please advise us of any concerns manu-

facturing a celluloid capable of being sprayed on the product? On my visit to New York recently I noticed several products having a celluloid finish containing a grained effect. No doubt you are familiar with the company manufacturing same.—D. E. Co. (Industrial and Commercial Wood Products).

Steel Door Finishing

On page 33 of your December, 1935, issue, there appears an article entitled "Finishing Steel Doors." It tells about a special finish used on steel doors for the Hayden Planetarium, such doors being supplied by "a concern in Long Island, N. Y." Wonder whether it would be possible for you to give me the name of the concern who made and finished these doors?—L. B. W.

EDITOR'S NOTE: It's the Superior Steel Door & Trim Co., College Point, Long Island, N. Y.

Quick-Drying Size; Burnished Finish

As you print INDUSTRIAL FINISHING I believe you can tell me where I can buy the very best quick-drying size. I can get some here (Los Angeles, Calif.) but I want the best. Also, let me know where I can get some of the finest high-gloss finishes like burnished high gloss and burnished mirror gloss. I have heard of these but don't know where to get them.—C. W. L.

Copper Paint

As per your advertisement discussion in the March, 1936, INDUSTRIAL FINISHING, please advise me the name of the maker of "Copper Paint."—W. A. H.

Will you please send us the name and address of the manufacturer of the pure leaf copper powders mentioned in the article on page 24 of March issue?—S. O. A. Co. (Button Mfr.).

In March issue of INDUSTRIAL FINISHING, on page 24, we note an article relating to copper powder. One of the claims stated in this article, for the flake copper used, is its ability to remain in suspension in the carrying vehicle for a long time. We are manufacturers of an electrolytic

NU-TIPE

Wiping Stains

are Worth Investigating!

Write for samples of these wiping stains that provide far greater uniformity than all other oil stains. Their use greatly reduces the need for shading.

For trimmings on table legs and case goods and other surfaces, NU-TIPE Wiping Stains provide light uniform colors as color-fast as water stains. Made for brushing, dipping, spraying.

THE LAWRENCE-McFADDEN CO.

1400 FRANKFORD AVENUE

PHILADELPHIA, PENNA.

Metallic

BRONZE FINISHES

Gold, Silver, Colored Effects in Bright, Soft, Vivid Tones.

ALUMINUM

All Grades Including

LINING POWDER

The Original

M-D-LUMINUS PASTE

(Trade Mark Reg.)

U. S. Products are backed by years of specialization and research in the manufacture of Bronze Powders of ALL TYPES.

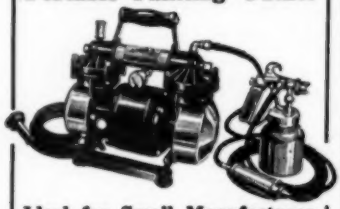
Send us a description of the surface to be finished and you will receive a beautiful color chart of appropriate bronze finishes.

U. S. Bronze Powder Works, Inc.

220 W. 42nd St., New York, N. Y.

CROWN AIRFLO

Portable Painting Outfits



Ideal for Small Manufacturer

The new Airflo outfits (¼, ½ & ¾-hp.) have ample capacity to handle lacquers, synthetics and all modern finishes with speed and satisfaction.

Compressors operate without oiling —CLEAN air always—fewer moving parts — extremely portable. Greater painting power per motor horsepower guaranteed. Send for details.

Crown Spray Gun Mfg. Co.

1218 Venice Blvd., Los Angeles, Calif.

Warehouses in Principal Cities

copper powder of a very high degree of purity and having a very low density. The density of our material is in the neighborhood of .3, weighing approximately eight grams per cubic inch.

If consistent with your policy, would appreciate knowing the manufacturers of the particular paint referred to in this article, so that we may bring our material to their attention.—The General Metals Powder Co., 130 Elinor Ave., Akron, O.

EDITOR'S NOTE: The concern in question is Van Dyke & Rice, Inc., 718 E. 16th St., Los Angeles, Calif.

Oil Solution for Use Under Lacquer

On page 20 of April INDUSTRIAL FINISHING there is a description of an oil solution used under lacquer which is apparently something different from the usual so-called permanent penetrating stain. We wonder if you can give us the name of the manufacturer of this material, or tell us where samples may be obtained?—A. C. Lacquer & Chemical Co.

In reading the April issue of INDUSTRIAL FINISHING magazine, I found an article by W. R. Cockerham, entitled "Modern Wood Finishing". In this article he told about an "Oil Solution Under Lacquer". We are finishing wooden food trays at present with a low-viscosity lacquer and I am interested in this system which obviously lowers the finishing expense. Will you furnish me with any information on this subject which you think would be useful, and also the manufacturer's name so that I may send for samples?—X. Mfg. Co.

EDITOR'S NOTE: It's Maas & Waldstein Co., 432 Riverside Ave., Newark, N. J., a regular advertiser in INDUSTRIAL FINISHING.

Liquid Rubber Finish

In the March issue of INDUSTRIAL FINISHING, we note on page 53, under the heading of "Letters from Readers of INDUSTRIAL FINISHING", that the G. H. Co. (Commercial Finishers) is interested in obtaining information relative to a rubber finish for metal. Inasmuch as we manufacture a liquid rubber that can be sprayed, brushed or dipped, and which is air-curing, we would be

pleased to have the name and address of this concern so that we might get in touch with them relative to our "Selfvulc" products.—Self-Vulcanizing Rubber Co., Inc., 605 W. Washington Blvd., Chicago, Ill.

Printing Lacquers

Could you please advise us the name of manufacturers of printing lacquers?—K. Products (Pearl Essence Finishes).

Flexible Lacquer for Rubber That Stretches

In your article "Letters from Readers", on page 55 of April issue, the subject "Flexible Lacquer" sounds very interesting for our line also. Kindly give us the name and address of the manufacture of this new flexible lacquer.—M. C. Products Co. (Shoe Finishes).

Please give us the names of manufacturers who make flexible enamel or lacquer suitable for coating flexible rubber articles.—G. D. V. Co. (Automotive Parts).

EDITOR'S NOTE: The particular item referred to in this case is offered by the Roxalin Flexible Lacquer Co., Inc., 800-1 Magnolia Ave., Elizabeth, N. J., a regular advertiser in INDUSTRIAL FINISHING.

Water-Oil; Rubbing

In the May issue of INDUSTRIAL FINISHING we notice an article on page 8, "Furniture Finishing in Small Factory" by James W. McFadden, in which mention is made of "water-oil". Will you please advise us where we could obtain complete information in regard to this product?—B. D. Co. (Manufacturers of Furniture).

In the May issue of INDUSTRIAL FINISHING, on page 8, you have an article headed "Furniture Finishing in Small Factories", written by James W. McFadden. In this article he mentions the following: "For rubbing semi-gloss varnishes we use an apparently new product known as 'water-oil'." He states that it doesn't require any oiling off or silexing and the semi-gloss varnish does not have the tendency to soften back under "water-oil" as it does

A NEW BLONDE FINISH

This new and beautiful Blonde Finish is a recent development of our laboratory.

We continue to keep a step ahead in new finishes for the furniture manufacturer.

Write for samples and Bulletin No. 13 giving specifications for Maple, Pine and Mahogany.

SPRUANCE QUALITY

Specialists in manufacture of Wood Finishing Products, Varnishes, Lacquers and Enamels since 1907.

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RICHMOND AND TIOGA STS.
PHILADELPHIA, PA.

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- IN ALL COLORS
- FOR ALL EQUIPMENT
- FOR EVERY PURPOSE

Skilled chemists in our research laboratory are at your service. Let us help you develop or reproduce that special effect or color tone. Send us a sample or description of what you need.

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Pioneer Manufacturers Since 1875

TAKE IT EASY!

Save time, energy and money by using these highly flexible, quick-sticking masking tapes. They leave keen, clean edges for exact color separation in every weather.

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The perfected paper masking tape. Noted for ease and accuracy in handling.

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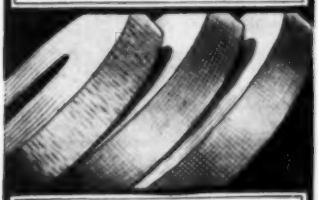

Send for sample rolls
Sizes: ¾ in. to 36 in. wide in 60-yd. rolls

THE REVOLITE CORP.

A Subsidiary of Johnson & Johnson

NEW BRUNSWICK NEW JERSEY

with paraffin or other so-called rubbing oils. Will you please advise us where we can purchase some of this "water-oil"?—S.-G. Co., Ltd. (Lacquers, Enamels, Paints & Varnishes).

EDITOR'S NOTE: The author advises us that this is a product of V. J. Dolan & Co. (an advertiser) 1830 N. Laramie Ave., Chicago, Ill., and further that "with proper reduction with water, 'water-oil' may be used as a polish, cleaner or rubbing oil."

Flock Finish for Toys

Through the courtesy of the Valentine Co. of New York City, we would thank you to give us full information on a cloth-like finish in paint that looks like "pool cloth." Also, advise if a spray gun application will be necessary. Your immediate cooperation will be appreciated, as well as a sample can of this material for testing purposes and prices on same.—C. S. Co. (Designers & Manufacturers Mechanical Toys).

EDITOR'S NOTE: Evidently this company has in mind flock finishes. Names of manufacturers of materials and equipment have been forwarded.

Tavern Table Finish

We have been interested readers of INDUSTRIAL FINISHING for quite some time and have found in this magazine much that is of assistance to us. We are now faced with a problem on which we will require some assistance and we feel that you are probably better fitted to render this help than any one we know of at the present time.

We are called on to furnish some tables which are to be used in a road house and which tables are, of course, subject to quite a lot of abuse, both from alcoholic drink and burning cigarettes. It has been suggested that we finish the tops with "El Duraco Varnish", and having no information concerning this particular material, we wonder if you can supply us with any information or give us the name of the manufacturer of this material.—S. B. C. Co. (Office Desks "That Sell and Stay Sold").

EDITOR'S NOTE: In the 1935 Trade-Mark Directory of the National Paint, Varnish & Lacquer Association, Inc., we find no "El Duraco". The nearest thing to it is "Durako",

a synthetic varnish by Preserve Surface Co., Inc., Detroit, Mich. Names of other manufacturers of "burnproof" and "alcoholic-proof" finishes have been supplied to the inquirer.

Metal Casket Finish

We are extremely interested in the article appearing on page 40, of the May issue . . . . "Metal Casket Finishes" by M. Langius. Is the process explained by Mr. Langius, used by the American Casket Co., who supplied the photograph for making the cut at the top of the page? We would appreciate knowing the address of the American Crown Casket Co. or the company using the process referred to by Mr. Langius.—T. V. C. Co. (Bronze Powders).

EDITOR'S NOTE: The casket manufacturer referred to is located at Zeeland, Mich.

Tack Rags

We would appreciate your supplying us with the names of manufacturers of tack rags.—S. N. S. Co. (Oil Storage Equipment).

EDITOR'S NOTE: A tack rag manufacturer's ad. appears on page 59 of April issue . . . . Wm. A. Juergens Co., 4040 Lagrange St., Toledo, Ohio.

Oil Stove Enamel

We are interested in a decorative baking enamel suitable for finishing oil stoves. Kindly furnish us with a list of your advertisers that can supply us with information on this material.—E. Co.

Abrasive Tests

Possibly in 1928 or before, the lacquer trade was familiar with a reciprocating block for rubbing—a block that had abrasive under it and an arm hinged to the top of it to reach a revolving crankshaft or camshaft which transmitted power to move the block back and forth. Mr. Abbiati of the Merrimac Chemical Co. thinks it very likely that your publication described it.

Our Textile Chemist's Association is planning to use something like this, and an old printed notice would help us to know where we stand if

Ross Systems

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questions should come up about any restrictions against the use of this plan, as might happen due to some new patent thought to have some resemblance to it. So your old record should be a great help, if you could readily find it for us.

I understand the idea has now gone over into testing playing cards and has turned up anew in the May 15, 1936, issue of INDUSTRIAL & CHEMICAL ENGINEERING CHEMISTRY, while in lacquer it is abandoned in favor of the spatula and the Florida weather tests.—D. C. W. Co. (Manufacturing & Consulting Chemists).

EDITOR'S NOTE: We find nothing about this in back issues of INDUSTRIAL FINISHING. Does some reader have any information on this?

Wooden Gift Articles

Can you give us a source of information on shop practice as used in the low-cost production of small wooden gift articles such as book ends, small trays, smokers' novelties, etc.? Either handbooks or professional publications would furnish the help we want on shop equipment, methods of rapid production and finishing in quantities.—G. Craftsmen.

Pickle Pine Finish

In a recent issue of INDUSTRIAL FINISHING you had an article that dealt with the various finishes on pine wood. At this time we would like to secure information regarding what is called "Pickle Pine Finish". We understand that some furniture factories are using this finish, and if you can give us any information as to how one applies this "Pickle Finish" on pine, we would appreciate it very much.—L. Furn. Co. (Reproducers of Early American Furniture).

I would appreciate any information that you may care to give me regarding the methods used and materials required to produce the so-called Pickled Pine or Platinum Finish referred to in your recent issue of the INDUSTRIAL FINISHING Magazine.—D. C. E.

EDITOR'S NOTE: An article in the "What's New" section of April issue, entitled "Pickle or Platinum Pine, Maple or Mahogany", reveals brief information about the finishes and gives the manufacturer's name . . . . Grand Rapids Wood Finishing Co., Grand Rapids, Mich.

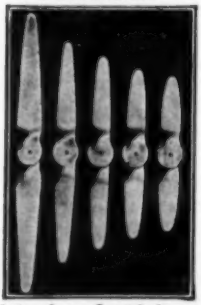
Bleaching Wood

We are desirous of obtaining a bleaching liquid used in finishing for bleaching stains in woods, and would appreciate any information you could give us as to a direct source of supply on this product.—T. D. Co. (Finishing Specialties).

In the April, 1936, issue of INDUSTRIAL FINISHING, we note that someone is writing for information concerning a process for bleaching mahogany. We would appreciate very much if you would send us this information also, as occasionally we have this kind of work to do.—B. M. Co. (Makers of Novelty Furniture).

In the October, 1935, issue of INDUSTRIAL FINISHING, there appeared an article regarding a "Patented Wood Bleach". Would you be good enough to give us the name of the firm that manufactures this wood

AEROPLANE TYPE EXHAUST FAN PROPELLORS



16-in.....$4.00
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36-in.....12.00

Made of Nickel Alloy Aluminum. Machined — Finished — Balanced. Guaranteed in every respect. Send for descriptive circular and new low price on Complete Fans or parts to make any size exhaust or ventilating fans. Special discounts given dealers.

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324 W. 10th Street Indianapolis, Ind.

..."top quality" paint & varnish thinner
...excellent for use in spraying, brushing and dipping.
SUN OIL CO. Philadelphia, Pa.
SUNOCO Spirits

bleach, as we are interested in same?—O. B. Co. (Furniture Manufacturer).

EDITOR'S NOTE: One of the well known bleaching materials regularly advertised in INDUSTRIAL FINISHING (see May issue, page 78; April, page 65; March, page 67, etc.) is "Blanchit" made and sold by L. R. Van Allen & Co., 408 N. Wells St., Chicago, Ill.

To Seal in Cedar Oil

Can you furnish me with any information about a finishing material to be used on birch and over an oil wiping glaze that the fumes from cedar will not soften? I have tried varnish, lacquer sealers, lacquer and shellac, but all of them, after a few weeks, become very sticky when used on the insides of covers to chests that are lined with cedar.—D. E. H. (Finishing Foreman).

Hand Buffing Unit

We are interested in obtaining some information on a small hand-buffing unit. Can you supply us the names of several manufacturers producing such equipment?—F. J. E. Co. (Finishing Materials).

Fan Blades

Please turn this inquiry over to all manufacturers of fan blades and ask them to quote us immediately on fan blades turning a minimum of 1800-r.p.m. The fans are to be 20-in. in diameter, 6-blade, roller bearing, with V-belt. This is a very rush inquiry.—B. M. Co. (Novelties, Signs, etc.).

Kindly give me the address of Universal Mfg. Co., a concern that advertised propeller fan blades.—M. J. (Auto Painter).

EDITOR'S NOTE: The Universal Mfg. Co.'s ad. is in this issue, see page 66. The address is 324 W. 10th St., Indianapolis, Ind.

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Manufacturers of Dipping and Tumbling Equipment

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Imperious Requirement of Furniture Manufacturers

BLANCHIT - BLONDE

Authoritative Modern

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Made by L. R. VAN ALLEN & CO. CHICAGO

Just try this . . .

You'll experience a vast improvement in your finishing schedule. Q C P W Stain is a quick coating pigment wiping stain developed out of years of experience in stain manufacture. Available in all desired shades. Applied by spray, dip, brush. Wipe in 5 to 10 minutes. May be coated in ONE HOUR. Write us for sample and full details.

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(Quick coating pigment wiping)

STAIN

Dries to Recoat in One Hour

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Industrial FINISHING

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EDITORIAL

Product Design . . . . Doubles Sales Volume

When you are told that sales of a product have doubled after a complete redesigning job for style appearance, you become interested. Perhaps the same thing can be done with something in your own line. Many products have been and are being completely redesigned to produce smart stylish lines and color effects which invariably attract favorable attention, excite admiration, stimulate interest, and stir the buying urge of prospective users. Take, for instance, the restyled White motor trucks. The Assistant Advertising Manager tells about it in "Industrial Marketing." Excerpts from his article follow:

White officials studied the possibilities. In an age of streamlining, when everything from refrigerators to passenger trains was receiving the flowing touch, there could be no great gamble on a motor truck. Evidence of acceptance was all too promising. White officials decided to take the step.

The first problem was to find a stylist who could do an outstanding job. The hand of White reached into Europe and brought forth an internationally famed industrial stylist. This expert was given full freedom to style the entire outside appearance without any restrictions in interchangeability, utility alone being considered in conjunction with beauty.

The result was a revolutionary new series of trucks streamlined from bumper to tail light with no reservations. Streamlining took in both chassis and body, featuring a perfect blending in color and molding design for radiator shell, cowl, hood and rear; fully streamlined headlights, and a new fender design bringing out creased center lines. Parallel lines also dominated the vertical radiator louvres, the side splashers and running boards. The stylist had, indeed, made use of all the tools at his command. But to climax the new offering, White installed its latest, powerful 6-cylinder Pep-Head 270-in. engine. The finished product was then given one of the most severe six-weeks' test possible before it was finally OK'd.

Information spread and so great was the market response that 500 orders were received before the first showing at Cleveland last fall—mute evidence that truck operators wanted style. White went into heavy day and night production with payrolls hitting the highest peak since 1929.

Sales of The White Motor Co. for January showed an 80% increase over the same month of 1935. Orders and deliveries for February doubled last year's figures, and March ran far ahead of February, as well as ahead of March, 1935.

As a result of these gains, and the enthusiastic reception accorded the first completely streamlined truck, the company decided to extend streamlining to the entire White truck line beginning with March.

Incomes Restored; More Buying of Quality Goods

With the incomes of more individuals and business concerns restored to normal, and in some cases riding above normal, the volume of buying in most lines has become remarkably heavy. But people are not loading up with a lot of cheap stuff where any permanence is desired; they learned the folly of that during the late depression. A good quality of merchandise is desired and is being demanded.

A number of large manufacturers, sensing this trend, are putting more quality into their products and depending upon a greater volume of sales rather than upon increased prices to take care of their profits, for the present. This is the first step. The second phase of returned prosperity will undoubtedly witness small or moderate increases in prices for the better class of goods.

To produce better quality goods in volume calls for good quality materials and equipment. Much of the equipment in factories that do finishing is obsolete and requires replacement. Additional equipment is needed or will soon be needed in many factories. It is recommended that the executives, including department foremen, in every manufacturing concern make it a point to carefully examine the advertisements of trade journals in their field and send for literature and catalogs of the latest equipment offered by these companies. Progressive firms have developed much that is new or improved, and they are telling you about it in your favorite trade magazine. You owe it to yourself and to your company to be well informed along this line.

Editor Wants Articles From Practical Men

Men who have anything to do with the performance, maintenance or supervision of finishing operations, and those who buy, sell, demonstrate, or test finishing materials, supplies, or equipment are invited to write and send in articles to Industrial Finishing. Short or long, with or without illustrations, handwritten or typed —they are all welcome and whatever the Editor can use "as is" or in rewritten form, will be published and paid for. Articles about the application of finishing coats to leather, rubber, canvas and paper are particularly desired; also, metal cleaning and finishing, wood finishing, etc. Lists of other subjects will be furnished on request. This invitation is especially extended to practical men in the industry who have never written before.

What Styles, Woods and Finishes Are Popular for Furniture

News releases from The American Furniture Mart, 666 Lake Shore Drive, Chicago, Ill., following the Spring Show in May reveal interesting suggestions and information for furniture manufacturers. For example:

The mid-season market was a great success. Buyer attendance, approximately 2,000. As for styles which sold well, it seems that the Messrs. Chippendale, Sheraton, Heppelwhite, in addition to the Brothers Adam, must have had the right idea about furniture, because buyers were partial to these 18th Century designs. However, modern and Early American also sold well. There were a great many different woods in evidence in these styles, with the blond woods coming in for a lion's share of the spotlight on Modern. The new woods included copper oris, Sequoia, honey maple, etc. Business, according to manufacturers, was around 50% better than a year ago.

Maple has taken on a two-faced appearance—the Early American species and its step-sister, modern maple. Both types were present.

The revival of 18th Century means more mahogany. There is still more walnut than any other wood, due partly to Modern holding out so strong, but there's also a tendency toward bleached woods, like bleached mahogany, bleached cherry, and bleached holly, especially for occasional pieces. This trend may be a reaction from the array of black or dark walnut occasional pieces. There seems to be more massiveness in occasional pieces too, not that they're much larger, just a little more substantial; that is the greater thickness of the wood is noticeable. Manufacturers are still combining occasional pieces, making them combine space for liquor accessories, magazines, books, coffee serving accessories, fish-bowls and what not.

SYNTHETICS
• ALL TYPES for
• ALL PURPOSES
• ASK FOR DEMONSTRATION
ROWE PAINT CO.
Long Island City, N. Y.

Modernization—The Trend in Industry

A manufacturer's bulletin carrying the above title has just come to our attention and it contains many thought-provoking suggestions worth passing along. For example:

Scrap the obsolete for the modern.

"If equipment can effect a saving in your plant, you are paying a tax equal to that saving until you install that equipment."—Henry Ford.

Progressive industrialists have found that there is no more effective way to cut production costs than to modernize their equipment . . . . essential in control.

You may think your processes do not need greater accuracy, but modern competition is constantly demanding more precise manufacturing methods. Accuracy has become a sales point that can not be overlooked. Precision is a vital factor in improving quality and speeding up production.

Recognizing the importance of greater accuracy, one leading manufacturer has included in his modernization program the scrapping of 50 obsolete tools, replacing them with an equal number of modern tools that bring laboratory accuracy to industry.

Exacting engineers want depend-

ability, ruggedness and low maintenance. Heavier, stronger working parts give the best tools and apparatus that built-in endurance requires for industrial service today and tomorrow.

You recognize the truth and logic in these statements which are particularly applicable to the successful management of every industrial plant at this time.

Classified Advertising

EXPERIENCED SALESMAN

With active following among volume accounts in New England seeks new connection. Aggressive, competent, can produce substantial results in industrial finishing field. Address IF-613, care Industrial Finishing.

SALESMEN WANTED

A large and well established eastern manufacturer desires the services of two salesmen: one for the Chicago territory and one for the Detroit territory. One with knowledge of lacquers and varnishes preferred, but not essential. State fully past experience and salary expectations. Address IF-611, care Industrial Finishing.

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With established following wanted by reputable eastern manufacturer. Attractive proposition for immediate business. State volume and territory covered. Address IF-606, care Industrial Finishing.

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Practical Japanning and Enameling

HERE is the first authoritative handbook of its kind, containing much information that has never before been published. You will find between its covers facts, processes, and formulae that have been considered secret by many japanners.

The author has actually been doing this work for others for many years and he knows whereof he speaks. No one has ever gone into the subject of metal finishing more deeply than he nor has the subject ever been explained so clearly and effectively. This book was eight years in preparation.

Color plates and a multitude of tables and illustrations make the text even more clear and understandable. The volume is bound in harmony with its companions of the Practical Finishing Series and makes a rich, attractive appearance . . . 22 chapters.

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